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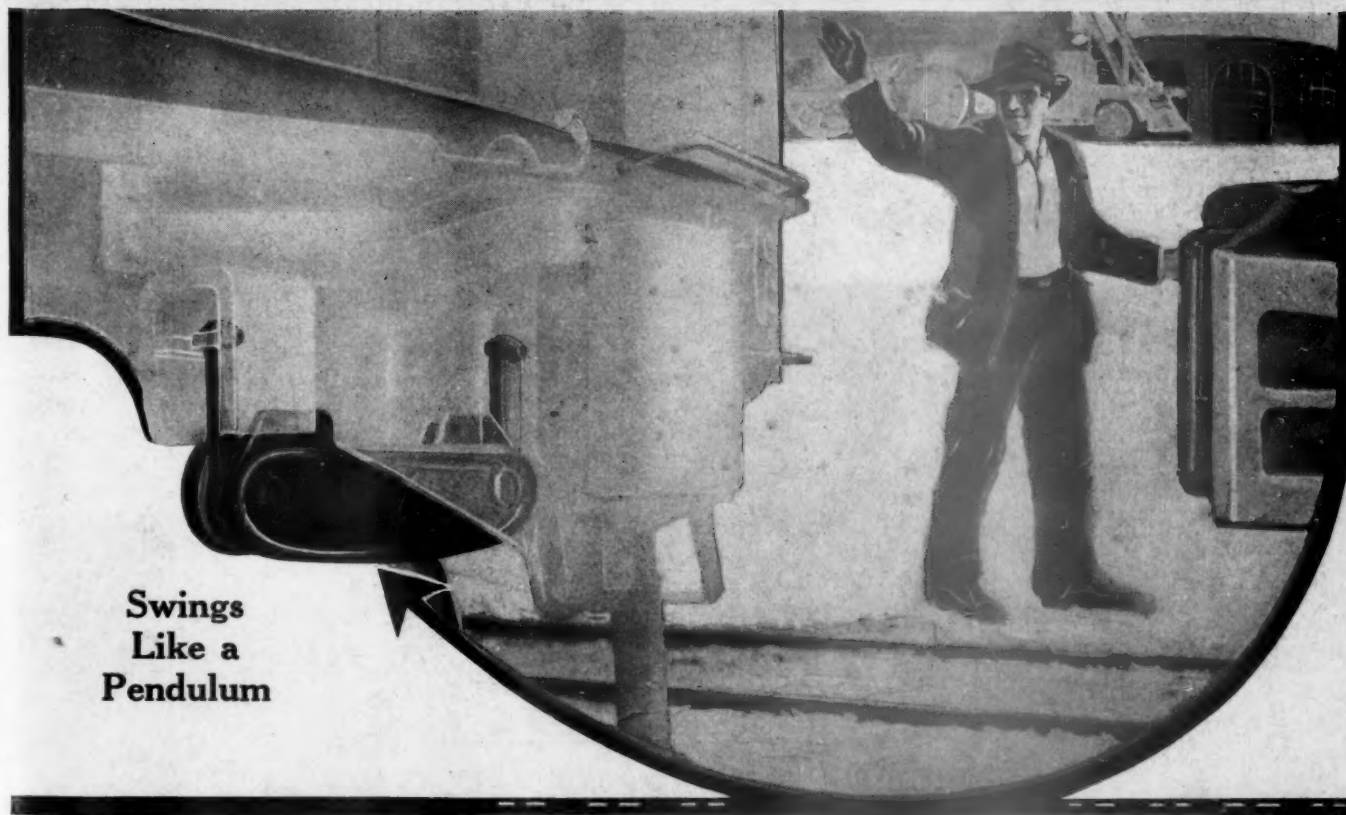
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SIXTY-SEVENTH YEAR

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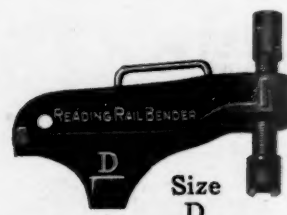
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EDITORIAL

Railway Age

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The third of the series of articles by Samuel O. Dunn, editor of the *Railway Age*, dealing with European Railways appears on another page of this issue. The

Poor Passenger Service in Europe

The first two articles had to do primarily with the activities of the International Railway Congress at Rome. The present article, however, is made up entirely of Mr. Dunn's observations of railway service in Italy, France and Switzerland. His portrayal of conditions there does not give a particularly happy picture. The war, of course, retarded railway development more in Europe than in this country. The building of equipment for high-class passenger service suffered particularly and it is the difficulty of securing accommodations and the overcrowding of trains which is most trying to the traveler in Continental Europe at the present time. Other conditions exist which are less excusable. The customs and passport formalities at international borders, of which there are many more since the war, are made needlessly uncomfortable for the traveler. Customs examinations are, of course, necessary but there is little excuse for the passport nuisance, especially between the countries allied in the war. Europe might learn much from the ease of traveling between the United States and Canada. There are, to be sure, many things to admire about these foreign railways. The speed of express trains in France has been restored to the high rate of pre-war days. Another point deserving favorable comment is the greater comfort of the seats in these trains as compared with our own. This, Mr. Dunn says, is especially noticeable in the seats provided for daytime use by making up the berths in the sleeping cars. All in all, however, it seems likely that the American tourists who are now "invading" Continental Europe will come back with a much higher appreciation of the adequacy, comfort and speed of American passenger service.

Few provisions in the working agreements with the train service organizations are more unsatisfactory to the man-

One Way to Reduce Overtime

agements or more demoralizing to the employees than that regarding overtime. The heavy penalty constitutes a severe tax on operation, while it offers an incentive to the crews to loiter on the road rather than to get their trains into the terminal. The local operating officers on one road have set out to reduce this overtime by offering a counter attraction to the men. On one division they found that it was possible for a crew to take a tonnage train over the road in approximately seven hours. As an incentive to a crew to make a good run they offered to provide a return train on arrival so that the men could get home without a long tie-up at the away-from-home terminal and then have 24 hours or more at home while making the same mileage as before. On another division where a slightly longer time was required to make the run with a tonnage train, it was found possible to provide time freight trains for the return trip so that the crews could make the round trip well within 16 hours. On another division where it was not possible to perfect such an arrangement, the engine districts were rearranged to require approximately 14 hours for the run, with the result that a crew which began to earn overtime

ran the danger of being tied up on the road. In each of these instances overtime became a dead issue because the men were offered an incentive to avoid rather than to earn it. If the managements will offer the men equally favorable inducements to move their trains over the road as the rules now offer for delays en route, the overtime provision can be made very largely a dead letter.

Few Americans knew the meaning of the word "propaganda" until the activities of Germany in this country prior to our

More German Propaganda

entrance into the war became known. Quite naturally, then, the Germans, who were the first to engage in propaganda on a large scale, have not forgotten that there is such a thing. They are still using it against the welfare of the American people. The most recent example of such activity has been brought to our attention by a letter from E. St. J. Greble, Jr., manager of the Baldwin Locomotive Works' office at Bucharest, Roumania, to a New York newspaper. This letter was in protest to Berlin dispatches which had appeared in that paper alleging that American locomotives in service in Roumania were proving unsatisfactory. Now it happens that just the contrary is true; the American locomotives are proving entirely satisfactory and are being used to bring in trains which German locomotives can not handle. Last year we had the privilege of translating and publishing an official statement denying similar scurrilous reports about American locomotives in service in Belgium. Indications were that this propaganda, too, emanated from Germany. If this is the manner in which Germany is attempting to reinstate her industry in the world's markets, then let our manufacturers know with what unscrupulous competitors they have to deal! Moreover, prospective buyers of German goods should learn the character of those who are attempting to gain their goodwill and take their promises and representations with the necessary grain of salt.

It is a regrettable fact, becoming more generally appreciated, that the majority of railroad shops are not equipped with machinery sufficiently powerful to

Possibilities of High Speed Tools Not Realized

work high speed steel tools to anywhere near their capacity. A longer time than necessary, therefore, is required to repair cars and locomotives and labor costs are correspondingly higher. This condition could hardly be otherwise since a large proportion of present shop machinery is ten or more years old. Even a few years ago it was the problem of tool experts to develop cutting tools which would utilize the full power of machines. Today the problem is reversed. The extent to which modern manufacturers have been successful in developing both accurate, high production machines and cutting tools which stress them to the limit is little short of astounding. The development of modern automobiles would have been an absolute impossibility without modern machine tools. The supremacy of America both industrially and mechanically is also dependent on such tools. It is an inescapable conclusion that the railroad industry, holding as it does sec-

and place among the industries of the country, should not be satisfied until obsolete, inefficient shop machinery and tools are replaced by modern equipment. Is there any inherent reason why the average railroad shop should always be considered the last place to look for productive machinery and efficient methods?

The most obvious thing to say about the wrecking of the Lehigh Valley fast passenger train at a highway crossing, reported in the *Railway Age*, May 20, 1922, page 1176, is that this is a rare

**Automobiles
as Wreckers of
Passenger Trains**

occurrence; that, usually, the person or persons in the automobile will be the only sufferers from defying a hundred-ton locomotive, running at a mile a minute; but when it is remembered that automobile freight trucks, the use of which is constantly increasing, sometimes weigh as much as ten tons, truck and load together, one realizes that derailments at crossings are likely to become less rare. Heavy automobile trucks, requiring perfect braking apparatus, seem to be entrusted to inexperienced or untrained drivers as freely as were the smaller vehicles of former days. A ten-ton obstacle is not so easily thrown aside. Solely as an element in self-preservation, railroads will be obliged to take a hand, as citizens, in the regulation of automobiles. In the light of such a case as this last one, the idea of improving the situation by calling on the owner of the automobile to pay for the damage he has done to railroad property seems almost ridiculous. By the way, what rule of law or reason would justify a court in requiring the railroad company to pay damages to the passengers injured in the North Leroy derailment?

The news items from Tennessee, Pennsylvania and New York printed in the *Railway Age*, May 20, 1922, page 1192, afford encouraging evidence that the

**How Can We
Educate the
Auto Driver?**

enforcement of the stop-look-listen rule at highway crossings is making progress—though the progress is extremely slow. It seems that in Tennessee a period of five years has been required to bring about a realization that there is on the statute books a law requiring automobiles to stop; five years to bring about a realization of the well-known fact that printing a regulative law in the statute book frequently has no effect at all in actual regulation. A correspondent in Tennessee, commenting on the fact that in his state (as in every other) the majority of motorists seem to drive regardless of all warnings, including plainly lettered boards set up at the side of the road, calls for the improvement of such roadside signs by freeing them from the confusing influence of other roadside signs which do not conduce to safety; as, for example, advertisements. This is one more feature of highway regulation in which railroads will be obliged, for their own protection, to take an active part. The approved warning sign, the 24-inch round disk, on a post, set up 300 ft. short of each railroad crossing, has been subjected to some criticism as not sufficiently large and conspicuous. It would help to make it conspicuous if all unnecessary roadside signs were required to be taken down. Massachusetts has passed a law to regulate bill-boards, under which action has been taken in at least one city, looking to the removal of all bill-boards that are within 300 ft. of important highways. This is a very necessary improvement, for which thoughtful citizens have long waited. The law, however, has a local option feature; it is wholly permissive except as cities and towns pass ordinances, and active stimulation of local public sentiment will be necessary before there can be any marked benefit from it. Massachusetts, however,

has made a good start, which should be imitated elsewhere. High speeds are now permitted freely on highways all over the country. To keep up this practice with any reasonable degree of safety there ought to be a complete scientific and uniform system of roadside signals, to cover all dangerous points. It may seem fanciful to propose the actual carrying out of such an idea, for the obstacles to anything of the kind would be great; but the need is very plain. And it is plain that public spirited railroad officers have a duty in the matter; are not they, by reason of their long experience in signaling for high speeds, better qualified than any other citizens to formulate a correct plan?

Surprising as it may seem there is relatively little information available regarding the amount of traffic which rail

**Promising Field
for
Investigation**

should normally carry before it is worn to the point that requires renewal. Such limited data as have been collected indicate that the tonnage carried increases in a much greater ratio than the weight of the section. In other words, the experience of those roads which have adopted the heavier sections in recent years indicates that the investment in the added metal has been amply justified by the increased service, without considering the reduction in the cost of maintenance and the better riding qualities of the stiffer rail. Not enough information has, however, been collected up to the present time to enable this statement to be made conclusively. For this reason a plan of co-operative action which the Rail committee of the American Railway Association has perfected recently with two universities holds much of promise. Through arrangements made with Professor Herman Diederichs, director of Sibley School of Engineering of Cornell University, 10 senior students of that institution are now making a detailed investigation of the rate of wear of rails of sections ranging from 90-lb. to 136-lb. per yard on tangent tracks of the Delaware, Lackawanna & Western and the Lehigh Valley. Measurements are being taken on rails which have carried traffic ranging from 10,000,000 tons to 300,000,000 tons. Similar arrangements are also being perfected with the University of Arizona for studies on tracks of the El Paso & Southwestern and the Southern Pacific. The results of a large number of observations of wear on rails of varying section and service on different railways in various parts of the country should go far in establishing the life which may reasonably be expected from rail of various sections and promoting uniformity in renewals. This plan will also bring the students in contact with the practical problems of railway operation which should result to the future benefit of those who enter railway service. It is to be hoped that the Rail committee may be able to interest other universities in this work to the mutual benefit of the students and the railways.

Striking proof that the business of the country is not being seriously retarded by freight rates is afforded by recent re-

**Car Loading
Shows Business
Revival**

ports of freight car loading which show that general business, exclusive of coal, is moving over the railroads at a heavier rate than it was even in 1920, the peak year of railroad traffic and before the latest advance in rates. For the week ending May 13, the number of cars loaded with revenue freight was 777,359, an increase of 26,173 as compared with the corresponding week of last year, in spite of the fact that less than half of the normal amount of coal is now moving. The coal traffic for that week, 79,170 cars, was 82,109 cars less than the movement for the corresponding week last year. If this amount

of coal were added the total loading would have been 859,000, as compared with 843,000 cars loaded in the corresponding week of 1920. A similar statement may be made of the other weeks since the coal strike began. President Harding, in his address before the United States Chamber of Commerce last week, expressed in a way that attracts more public attention than the weekly reports of railroad car loadings a fact to which they have been steadily pointing for several weeks, namely, that "business is reviving" and "our country is finding itself again." When reports of the Car Service Division of the American Railway Association for April and the first part of May show more cars loaded than in the corresponding weeks of last year, in spite of the loss of coal traffic, it cannot be denied that business is not only improving but it has improved. As practically all business involves transportation it would be difficult to find a better rough index of the general activity of the country than is afforded by these weekly car loading figures. The President not only called attention to what has happened, but he declared that: "Undoubtedly there is more than a mere business revival in sight. We are on the threshold of a new era. We do not intend ever to be discouraged for a long time." Supplementing this address, it was announced on the following day that reports to the White House indicate a shortage of labor already in many localities, a highly gratifying improvement in agriculture as well as in most branches of industry, and even the possibility of a distressing shortage of common labor within 90 days. The reports have convinced President Harding that we are on the eve of a wholesome revival which he expects to continue. To all of which the *Railway Age* may properly add that these statements were made prior to the decision of the Interstate Commerce Commission reducing freight rates and also before the dinner at which the President urged the railroads voluntarily to reduce rates.

The Rate Decision

THE OPINIONS which will be expressed with reference to the rate decision announced on Wednesday will vary in direct ratio with the degree of optimism felt by the one expressing the opinion as to the present general business situation. The Commission's findings in favor of an approximate 10 per cent decrease in freight rates are made in the face of the fact that in 1921, at the higher rates, the carriers earned only 3.3 per cent on their property investment. They are similarly made in spite of the fact that the rate of 5.83 per cent earned in March, 1922, was largely due to the heavy coal movement in anticipation of the coal strike. Business, however, is picking up. Those of us who are optimists are hoping that it is going to pick up soon enough and sufficiently enough so that increases in tonnage will overcome the reduction in receipts per ton or per ton-mile. The Commission declares its business judgment to be to that effect. We hope that it has decided correctly.

One question that arises in connection with the rate decision is as to whether the reductions suggested should have been general or should have been confined to the basic commodities and we shall probably hear more about this. That some reductions should have been expected is hardly in question. General sentiment throughout the country was in favor of it and that is always a powerful factor. The public has felt for some time that rates were too high and that the result of the high rates was to act as a check on business. That theory is not holeproof. The depression of 1921 was due to many causes and would have occurred with high freight rates or low freight rates, and, at present, business is picking up in excellent fashion at the present high rates. Nevertheless, the high rates have been a detriment, particularly because they have upset commercial relationships and

have borne severely on certain commodities and on certain producing centers. The tenor of the times was in favor of some reductions.

Nor were the reductions unexpected. The manner in which surrounding circumstances accompanied—whether intentionally or otherwise—the announcement of the Commission's decision is worthy of comment. The calling of the conference with President Harding last Saturday evening indicated that things were about to happen. The decision followed the press reports of what was done at the White House sufficiently close so that the favorable effect of the one were carried over to the other. Business psychology is more or less of an inexplicable sort of thing. It has a manner when the general trend of affairs is optimistic of emphasizing anything that has a trace of optimism. It is to be expected, therefore, that the action which has been embodied in the rate decision will accelerate the present business revival.

The administration has had a great deal to do towards encouraging public opinion to believe that a reduction in freight rates would assist the revival of business upon which the Administration is placing so much hope. It seems only fair that the Administration should now supplement its efforts and exert itself in the coal situation. It can do more towards settling the affair than any other parties in the present mix-up. The roads are at present losing at least 80,000 cars of coal traffic weekly or in other words this amount of coal traffic is being deferred until after the end of the strike. The unbalancing of the coal traffic will be a handicap in many ways taking the year as a whole. The Administration, it would seem, would do the wise thing, if it now directed its efforts towards restoring the traffic supplied by the mines.

The Interstate Commerce Commission has shown itself in pleasing contrast to the Railroad Labor Board. The Commission has accepted the view that it can do something towards bringing about or assisting the revival of business. The Board seems to have no such attitude and the unfortunate part of the Commission's decision is that conditions are such that the actions on one body are not more closely correlated with those of the other. The Labor Board is willing to go on subsidizing railroad shop labor by permitting it a rate of wages much above that for similar work in other industries, and to permit this class of labor to thrive at the expense of the farmer and the consumer who pay the freight rates.

Further, the revival of business is now on. Does not the Labor Board know that when business picks up to a gradually greater extent the carriers will need all the cars and locomotives they can secure? Has it not been advised that the percentages of bad-order cars and unserviceable locomotives are almost hopelessly high and that repairs are being postponed for lack of funds with which to pay the present high wage scales? There is some talk that the Labor Board's decision is to be handed down July 1—the day on which the present rate decision will presumably become effective. One hopes that this belief is correct. The Board's decision cannot be made public too soon in view of the present conditions.

It is difficult to see how the railroads can do otherwise than accept the Commission's decision to reduce rates. They should, however, make their assent of greatest value to themselves and the public. There is no reason, for example, why, in making it, they cannot point out that their coal traffic is conspicuous by its absence and that the Administration should take a hand in adjusting the situation. They should certainly express themselves about the activities—or rather the lack of activity—of the Labor Board with reference to the shop wages decision.

There has, of course, been a very considerable amount of comment and guesswork about the purpose of the President

in calling the chief executives together at dinner to talk over the rate question. Because of the announced intention of the Administration to put more business in government and less government in business, it has appeared to many that the President was using this opportunity of cultivating better relations between the government and the railroads. He was undoubtedly informed of the decision of the Interstate Commerce Commission to bring about a reduction in rates, and it is quite possible that his action and the general attitude of the Administration were such as to induce the Commission to seek to have the railroads make a voluntary reduction, rather than have the Commission issue a formal order. If this is true, then it would seem wise for the railroad executives to accept it in this spirit and to take such action as will strengthen the roads with the public and the Administration and insure more cordial relations in the future.

Analyzing the rate decision as a whole, one is inclined to feel optimistic about it. The decision calls for reductions of about 10 per cent, but it includes those reductions which have already gone into effect through previous formal orders. The public was asking for lower rates and its getting them should have a salutary effect on business. It seems a sane guess that business will revive sufficiently to make up in tonnage what will be lost in revenue per ton. A "sane guess," of course, is not a certainty, but it will be more of a certainty if the coal and labor situations are ironed out with some degree of promptitude.

It is difficult to understand why the Commission should have determined upon a rate of return of $5\frac{3}{4}$ per cent. The Act established a rate of $5\frac{1}{2}$ per cent with the proviso that $\frac{1}{2}$ per cent might be added for improvements chargeable to capital account. The carriers need these improvements as much as ever. Presumably the figure of $5\frac{3}{4}$ was chosen because of its psychological effect, on the ground that it might look better to the public than 6 per cent. Public bodies frequently have a way of doing things in this manner. Perhaps we should be satisfied that the rate was not reduced more than $\frac{1}{4}$ per cent. We are not overly impressed by what the decision says about federal taxation.

Enlarging the Ananias Class

"LABOR" is the name of a weekly paper published in Washington by the railway labor unions to disseminate propaganda among railway employees to discredit private management and promote the Plumb plan.

In its issue for April 1 this paper published an editorial entitled "Dunn in Ananias Class." It quoted the following statement made by Samuel O. Dunn, editor of the *Railway Age*, in an address before the Citizens' Alliance of Minneapolis on March 22: "The main reason for existing rates is that the average wage per hour of railway employees is 120 per cent higher than five years ago." It then said: "The Associated Press accepted Dunn's statement as gospel truth, sent it out over its wires and it was given a position of prominence in practically every daily paper." "Labor" charged that "Dunn's statement is false," and added: "The average wage of railway employees has increased 59.2 per cent during the last five years, not 120 per cent as claimed by Dunn. That's the finding of the United States Railway Labor Board from data gathered exclusively from railroad sources. The supporting figures may be found in 'Report No. 3—Wage Series' compiled by the board in October 1921."

What are the facts?

First, Mr. Dunn compared the average wage *per hour* in 1916 with the present average wage *per hour*. In 1916, as shown by the statistics of the Interstate Commerce Commission, the average hourly earnings of the 90 per cent of railway employees paid by the hour were 27.8 cents. In Novem-

ber, 1921, the latest month for which statistics of the Interstate Commerce Commission are available, the average earnings per hour of railway employees paid by the hour were 61.8 cents. This was an increase per hour of 34 cents, or 122 per cent.

Second, the Labor Board in October, 1921, issued "Report No. 3—Wage Series." This did not give any statistics regarding wages *per hour*. It did not give statistics for any date earlier than December, 1917, which was only four years, and not five years prior to the date of the wage figures given by the board for 1921. The board's report showed that the average *monthly* rate in December, 1917, was \$78.06, and that after the reduction in wages on July 1, 1921, it was \$124.27, or 59.2 per cent more.

In other words, Mr. Dunn gave average *hourly* earnings for two periods approximately five years apart and "Labor" attempted to refute them by giving *monthly* rates of pay for two periods only four years apart.

Why is there such a wide difference between the relative increases shown by the hourly earnings and the monthly rates? One reason is, of course, that one of the comparisons made was between statistics for 1916 and 1921, and the other between statistics for December, 1917, and the latter part of 1921; and there were substantial increases of wages in 1916 and 1917. Another and the most important reason is that the eight-hour day has been established, that employees as a result now work fewer hours per month for their monthly rate of pay than they did in 1916 and that, of course, in consequence their hourly earnings show a correspondingly greater increase than their monthly earnings. Finally, the monthly rate given by the Labor Board included no earnings for overtime work.

But why use the hourly earnings instead of the monthly rates? First, because the employees demanded and have obtained reductions in their hours of work as a benefit to themselves. Secondly, because the increase in the hourly earnings is the true measure of the increase in the operating expenses of the railways which has been caused by both the reduction in hours of work and the advances in wages which have been made. The reduction in hours of work has made it necessary for the railways to employ more men to do a given amount of work. This, as well as the increase in the average wage per hour, has increased the payroll, and it is the increase in the total payroll which has contributed most to the increase in operating expenses which has made necessary the present rates.

How accurately under normal conditions the increase in the hourly rate of pay conforms to the increase in the total payroll is illustrated by the following facts: Between 1917 and 1920 the average earnings per hour of employees paid on an hourly basis increased from 31.8 cents to 66.5 cents, or 109 per cent. Between the same years the total increase in the payroll was from \$1,740,000,000 to \$3,698,000,000, or 112 per cent. The freight business handled in 1920 was only $4\frac{1}{2}$ per cent greater than in 1917.

If railway employees were working as many hours per day, or month, now as in 1916 they would be earning approximately 120 per cent more than in 1916 per day and per month. That the daily and monthly earnings per employee have not increased as much in proportion as the hourly earnings or the total payroll is due to the fact that they have chosen to have their hours of work per day and per month reduced.

We are not unaware that the Plumb plan agitators who edit "Labor" will not be influenced by the foregoing statement of facts to accept for themselves the membership in the Ananias Club which they have offered to the editor of the *Railway Age*.

We have stated the facts so fully for the information of railway employees and other persons who really want to know them.

Is the Engineer to Blame?

FEW INDOOR SPORTS are more popular today than that of diagnosing the railroad ills, and the cures which are offered in consequence are nearly as varied as the number of diagnosticians. A new remedy comes from Roger W. Babson, who finds that among other ills the railroads are suffering from too many civil engineers in high places. We feel that an indictment of those railway executives who fall within this class cannot go unchallenged.

"The construction period of railroading is gone by," says Mr. Babson, "there is no more reason why a civil engineer should run a railroad today than that he should run the Woolworth business or the Sears-Roebuck business." Apparently Mr. Babson's conception of railway engineering and construction conforms to the popular impression which pictures a man behind a transit fitting curves to a mountain canyon. Such railroad construction, of course, is a matter of the past, but is there no work for the engineer in the design and construction of the Cedar Hill yard of the New York, New Haven & Hartford, in the building of the new Union passenger terminal at Chicago, or in the direction of maintenance of way work on an enormous property like the Pennsylvania? But the field of the engineer in railway service is by no means limited to construction and maintenance of way, *per se*. Ample testimony as to the usefulness of the engineer in the gradually increasing complication of railway operation is to be had daily, and no better evidence is to be found than the increasing reliance which the American Railway Association is placing on the American Railway Engineering Association for the study of technical problems of railway operation.

But to turn to the question of executives—civil engineers have been chosen as railway executives not because they were civil engineers but because some of them have developed into efficient operating officers, and surely such names as Rea, Kruttschnitt, Loree, Storey, Kelly, Dice and Pearson are received with exactly as much confidence when signed to an annual report as those of other railway presidents whose early training was along somewhat different lines.

The Needs of Water Transportation

ONE OF THE PRINCIPAL objections to "government in business" must be ascribed to the fact that it frequently places the spending of other people's money in the hands of men who consider all too lightly the responsibility thus placed upon them. This attitude is frequently manifested by the War department in its control over railway crossings of navigable streams. The building of new bridges, or the reconstruction of old ones, usually calls for extravagant requirements as to the clear width and height of channel openings with apparently no effort to balance the pecuniary advantage to be derived by the existing or potential river transportation with the enormous burden placed upon actual and thoroughly established rail transportation.

This subject has been given attention previously in these columns but merits further reference because of the particularly illuminating demonstration of the mental processes of the War department in spending the railroads' money. The Cincinnati Southern's bridge over the Ohio river which was recently reconstructed, as described elsewhere in this issue, provides a waterway opening that is 500 ft. wide and has a clear height of about 40 ft. above maximum high water and 81 ft. above average low water. The high water clearance was not considered sufficient, so provision was made in the original bridge for an auxiliary high water channel along the Kentucky shore in the form of a draw span having a total length of 370 ft. and providing two channel openings of approximately 150 ft. each.

When plans for reconstructing the bridge were submitted to the War department, the requirements imposed for the high water channel in replacing the old swing span were such as to make it necessary to provide a clear span for the entire distance between the two rest piers of the swing bridge. That is, a 365-ft. lift span was provided so that the old pivot pier might be removed. This requirement was made in spite of the fact that there is no record of the swing span ever having been turned following the test made at the time of its completion 45 years ago.

The reconstruction of the bridge was carried out in accordance with these requirements and when the work was completed, and the costly lift span was ready for use except for the razing of the old pivot pier, the river steamer interests petitioned to have this pier left in place so that it could continue to serve as an ice breaker for the protection of steamers moored down stream from it during times when the ice was running. The cost of the real or fancied requirements of a visionary inland water transportation cannot be scrutinized too carefully in these times when a reduction in the cost of rail transportation is the topic of the hour.

Trying to Hold Down Coal Prices

RAILROADS should find considerable of interest in the announcements from Washington of the efforts being made by Secretary Hoover to bring about a plan of co-operation among the coal mine operators to prevent a runaway coal market and incidental high prices as a result of the curtailment of coal production by the strike. This plan is being tried as a substitute for the system of price regulation which proved so unsatisfactory during the war.

As indicated by the dinners at the White House attended by steel and railroad executives last week, the President is a firm believer that much can be accomplished by calling men together around a table for a frank discussion of important problems. The coal operators are rather too numerous to be invited to dinner together, but Mr. Hoover got about 50 of them, representing over half of the output of the mines now in production, into a conference, at which it was proposed to call a general conference of coal operators to consider plans for the better co-ordination of coal distribution and the prevention of profiteering by the formation of central and district committees to take measures to assure the direct progress of coal to the consumer in proportion to his need and on the basis of the Garfield prices adjusted to meet changed conditions. Although the conference was open to the press and although it was proposed that representatives of the government be members of the central committee, it was regarded as necessary to submit this plan to the attorney general to see if it is in violation of the laws intended to prevent combinations and agreements to raise prices.

Mr. Hoover does not express complete confidence in the success of the plan but says it is worth trying and as large consumers of coal the railroads will doubtless wish him well. He called attention to the fact that in 1920, following the 1919 strike, nothing was done until the price of coal had mounted to from \$9 to \$15 a ton. Coal is now selling at from \$2.25 to \$4 a ton, but although there has not yet been sufficient demand for coal to take the full output of the non-union mines, scarcity and competitive buying in some districts have caused advances in some quarters. On the present basis of production the Washington authorities do not anticipate any serious situation at least until June, but Mr. Hoover is taking warning from previous experience in trying to interest the operators in the prevention of high prices—which in many instances were enjoyed by the coal dealers rather than by the operators—and at the same time in trying to avoid excessive competition among buyers by suggesting the formation of buying committees.

New Books

Railroads and Government: Their Relations in the United States, 1910-1921. By Frank Haight Dixon. 5½ in. by 8¼ in. 384 pages. Bound in cloth. Published by Charles Scribner's Sons, New York.

In one of the early chapters of this book Professor Dixon quotes the Interstate Commerce Commission in 1910 as saying:

"We must not regard too seriously, however, the effort of railroad counsel to establish this Commission *in loco parentis* towards the railroads This country cannot afford to have poor railroads, insufficiently equipped, unsubstantially built, carelessly operated Nevertheless, it is likewise to be remembered that the government has not undertaken to become the directing mind in railroad management. We are not the managers of the railroads. And no matter what the revenue they may receive, there can be no control placed by us upon its expenditure, no improvements directed, no economies enforced."

To anyone who knows to what extent the Commission is now doing the very things that in 1910 it said it had no power to do, the importance of the subject matter of Professor Dixon's book will be at once evident. Railway regulation by the federal government has progressed farther during the period since 1910 than for all the years prior to that date. The Adamson Law, federal control, the Transportation Act, the Labor Board—all these terms reflect the importance of the period.

Yet, until the appearance of this book, the happenings during these years have been concealed from those not actually engaged in matters having to do with railroad policy in its broader, country-wide aspects. Concealed—not in the sense that the actual happenings from day to day and week to week have not been published and read, but in that no story of happenings day by day or week by week can emphasize and minimize various events according to their true importance—consequently the significance of the achievement of recent history is lost to everyone but the student who makes it his business to connect events into a well-balanced whole. Not many people, with the exception of the numerically few railway executives, legislators, economists and writers who have by the nature of their callings been kept in close touch with the minutæ of developments in Washington, have had even the approximation of a correct perspective of the developments of the past decade. And to acquire this perspective without this book would require weeks of toil—studying the files of magazines and newspapers, reports of Congressional hearings, decisions of the Interstate Commerce Commission, etc.

With the appearance of this book, however, all this has changed. Anyone with a fundamental knowledge of railroading can, with a few hours of reading, acquire an accurate knowledge of recent events in sufficient detail for ordinary purposes.

The Transportation Act has so many aspects that it is difficult to single out any one feature and call it the most important. The increased power which it gave to the Interstate Commerce Commission over rates can safely, however, be called one of its more important provisions. These rates are to be fixed according to the law which will provide, "under honest, efficient and economical management," a reasonable return to the railroads. A knowledge of the development in rate-making which preceded this enactment and the power which the Commission now has over interstate rates makes an interesting background now when existing rates, which have never provided the legal returns, are under fire from many sources. Surely no railroad officer ought to be without a rather complete knowledge of these things which affect so closely the welfare of his company.

Professor Dixon's treatment of the federal control period

is thorough and adequate. He agrees with most railway economists that it served a useful purpose during the war but that government ownership offers no solution for peacetime transportation problems. His criticisms of the shortcomings of the Railroad Administration may seem inadequate to some, but the whole book is characterized by an absence of partisan feeling and gains in power thereby.

Another recent development which Professor Dixon emphasizes is the increasing interest which bondholders are taking in the management and control of the railroads. It is, of course, well known that a large part of the capital invested in the railroads is represented by bonds which carry no voting power with them. These bonds are, for the most part, not met at maturity out of earnings but by refunding. The National Association of Owners of Railroad Securities, representing large holders of bonds, has made itself heard in many ways of late and this seems to be one of the really significant results which the past few years have brought forth.

The consolidation provisions of the Transportation Act have not meant much as yet. Ultimately, however, consolidations may be brought about which will have a profound effect upon the art of railroading in this country. Hearings soon to be held before the Interstate Commerce Commission will bring the problem to the front and those familiar with Professor Dixon's chapter on the subject will be at a decided advantage in following these hearings, whether or not they agree with his rather sympathetic leaning toward the proposal.

The regulation of wages and working conditions is ever a problem. The strange method of raising wages which the Railroad Administration followed, *i.e.*, the rapid advancement of the wage scales of lower-paid employees and a much lower increase for the higher grades, did away with differentials which had proved their value by long years of use. All classes of labor profited by federal control in securing improved working conditions. All but a few, notably the train and engine service men, profited by wage increases (by the Railroad Administration and the Labor Board) which increased greatly their standard of living. A return to normal conditions in this respect seems difficult of attainment.

The authority of the Labor Board is being questioned and probably not until the Supreme Court has decided several cases will it be able to go forward in the course it has laid out for itself or confine its activities as the court may direct. Last autumn the Board secured a point in its favor by its masterful leadership in bringing to naught an impending strike. Only an unthinking optimist, however, could assume that the labor problem on the railroads is solved for all time. It will come up time and time again and challenge the best minds that can be brought to deal with it. Professor Dixon is of the opinion that the Labor Board is a "valuable laboratory" for the study of this problem and is "entitled to a thorough test." With this position most of our readers will be in hearty accord.

Professional railroad-baiters attack the roads generally with carefully chosen statistics and plausible sounding economic theories. Most railroad men are occupied with the technical and operating problems of their own particular property and concern themselves little with the broad field of railway economics as applied to all the railroads. If the thousands of railway officers in the country were to inform themselves a little more thoroughly about the railroad problem in its broader aspects, fallacious theories advanced by anti-railroad "economists" would be checked before they could do much damage. For railroad men who desire to increase their ability to serve their employers this book is unhesitatingly recommended. Students and others who make it a business to keep abreast of modern thought along these lines will read the book as a matter of course.

Some Observations on European Railway Service

Traveling Is Difficult—Sleeping Car Service Inadequate— Trains Crowded and Rates High

By Samuel O. Dunn
Editor of the *Railway Age*

PARIS, France, May 9.

THE NEWSPAPERS report that American tourists are coming to Europe in unprecedented numbers. Anybody who has been traveling in Europe within recent weeks knows that thousands of Americans are here already. It is not indulging a facetious spirit to say that it is doubtful if this "American invasion" will tend to increase the good feeling between Europe and the United States.

There are some reasons, however, why it should, and undoubtedly will, increase the popularity of the passenger service of the railways of the United States among our own people. After an American who travels much at home has had an experience of a few weeks traveling on the continent of Europe under present conditions, he will be a strange person if he does not recall with longing the adequacy, cleanliness, convenience, comfort and speed of American passenger service.

It is not the purpose of this letter to criticise the railways of Europe or their management. The criticisms passed by the people of different countries upon each others' institutions, methods and customs very commonly are based on vanity, jealousy, ignorance or misunderstanding, and almost always tend to cause friction and antagonisms that often have serious results. But no reasonable person can take offense at a plain narrative of actual experiences given for a good purpose.

Now many of the people of the United States are disposed to complain about their railway service. A further fact is that they have less reason to complain about the service they get than almost any other people in the world. It is useful, therefore, to publish in the United States actual experiences on the railways of other countries, not in any spirit of captious criticism of other railways, but to help Americans who do not travel abroad to appreciate reasonably the favorable situation they are in with respect to railway service. Of course, many of the shortcomings of service in Europe are due to the aftermath of the war; but that does not make it any less true that they exist.

Shortage of Sleeping Car Service

One of the most outstanding features of railway service on the continent at present is the extreme shortage of sleeping cars. Practically all the sleeping car service is rendered by the International Sleeping Car Company, the headquarters of which are in Brussels, Belgium. Most of the Americans who came over here to attend the International Railway Congress arrived on the continent between the beginning and the middle of April. They were all somewhat startled to find that it would take some days to get sleeping car accommodation to Rome. The large party that came on the *Mauretania* arrived in Paris on April 11. Its members were advised that they could not get sleeping car reservations of any kind to Italy for at least a week!

At that time there was a rush of people going to Rome for Easter; but in spite of that it was somewhat of a shock to persons accustomed to American railway service to encounter such a condition of affairs. There never was a time as far back as I can remember, even during the war, when one could not within 24 hours get at least an upper berth on some train running between any two large cities in the United States. The upper berth in an open Pullman

car has its disadvantages; but it has great advantages over no berth at all.

A specific incident will perhaps best illustrate the sleeping car situation over here.

The president and the general manager of a certain American railway, and their wives, sought sleeping car reservations from a border point in France to Rome. They were told all space was sold a few days ahead. The president suggested that an extra sleeping car should be put on one of the trains. As the president himself tells the story, the railway employee to whom he made the suggestion, threw up his hands and exclaimed,

"It could not be done without a special decree from the King!"

So the American railway president and general manager and their wives arrived in Rome after having spent a sleepless night sitting up in a first class compartment.

This shortage of sleeping cars is a chronic condition. Persons desiring to leave Rome for Paris after the Railway Congress found all space on one train sold out for fifteen days ahead and the other trains completely sold out on all days of the next ten except two. Yet, curiously enough, there often are ways of getting sleeping accommodation even under these conditions. The tipping of employees in the offices of the International Sleeping Car Company prevails on a large scale; and a big enough tip paid to the right persons frequently causes entire compartments to spring up where not a single berth grew before.

Overcrowded Trains

The question will naturally be asked how, being unable to get sleeping accommodation, the visitors got to Rome. Some, as already indicated, sat up all night in day cars; others traveled by day, and got off and stayed at hotels in cities along the way at night. Whether they traveled by day or night, however, they found all trains overcrowded. The writer, since arriving on the continent, has traveled about 3,000 miles, east, south, west and north, on railways in France, Switzerland and Italy. Only for short distances in two instances—from Paris to Rheims and return on the Eastern Railway of France and from Lausanne in Switzerland to the northern border of Italy—has he ridden on day trains that were not overcrowded. By "overcrowded" is meant a train in which all the seats were taken and many persons were standing or sitting on their baggage in the corridors.

Before the war it was always possible to get seats in first class, and usually in second class, compartments on most European railways and many persons were expected to stand in the third class compartments. Now even in the first class compartments there almost always are more passengers than there are seats for.

Bedevelopment of Passengers at Frontiers

Passenger cars in Italy are especially crowded. In that country on almost every day train all the seats are taken and the corridors are so filled with people that it is difficult to move through them.

Needless to say, this shortage of passenger equipment is largely due to the war. It was impossible for the railways

to keep up their equipment during that long and dreadful conflict.

Other conditions are encountered, however, which are not so easy to explain or excuse. International through car service has not been satisfactorily re-established even between countries which were allies during the war, or between former belligerent and neutral countries. Imagine, for example, leaving the women of your party peacefully reading their magazines at a point on the border between Switzerland and Italy while you run forward along the platform to see what the customs officials do with your trunks, and finding on your return that the women, hand baggage, coats, books, canes and umbrellas have been unceremoniously dumped out on the platform. This was done to cut out a Swiss car and replace it with an Italian car.

Before the war, hand baggage was inspected in the cars. Now, on entering Switzerland, Italy or France, it usually must be taken out of the car, and passengers must go trooping into the customs office in the station to see it put through a perfunctory examination. Meantime your train is unnecessarily delayed an hour or more, and (under your breath) you curse all the bureaucrats of Europe, and rejoice that you live in a country so large that you are not bedevilled every few miles by customs officers who seem to exercise their ingenuity to make staying at home a pleasure.

The passengers on many trains are obliged to get up and visit the customs offices or frontier points in their night gowns and pajamas, in the middle of the night. To the traveler, one of the worst results of the disintegration of some European countries is the increase in the number of national boundaries and custom houses.

Inadequate Toilet Facilities

The very worst feature of railway service in some parts of Europe is the toilet facilities. These facilities on many day coaches in America are bad enough; but our worst cars are immaculate in this respect compared with many in Europe. The toilets in the first class cars of the better French railways are clean, and are provided with towels, soap and paper. As one travels eastward and southward the towels give out, and then the soap. The toilets of even first class cars in Italy often have neither towels, soap nor paper, and are too dirty and unsanitary for description. Italy is a very mountainous country, and the Italian railways are a fine product of engineering skill. They are at present among the leaders in electrification. It is painfully evident, however, that the management has devoted and now devotes very little attention to sanitary engineering. The stations—many of them handsome structures—need sanitation even more than the cars.

Regarding "de Luxe" Trains

The traveler can obtain very good accommodation on the "de luxe" trains between principal cities if he makes reservation several days in advance. These trains are made up entirely of sleeping cars; and the sleeping cars usually are clean and comfortable. But the difficulty of getting space on the "de luxe" trains never ceases. The Rome express, from Paris to Rome, for example, runs every day in the early spring, when tourists are flocking to Italy, and is always crowded during that season. Early in May, when travel to Italy becomes lighter, instead of being run every day, it is run only three days a week, with the result that reservations on it still must be made days ahead. The International Sleeping Car Company takes no chances of running with any empty berths.

A "de luxe" train on the continent does not mean the same thing as in the United States. Take, again, the Rome Express, which is one of the best examples of such trains. The distance between Paris and Rome is somewhat over 900 miles—not very much different from what it is between

New York and Chicago, or better Chicago and New Orleans. The better trains between these points in the United States make their runs from 20 to 24 hours. The schedule time of the Rome Express is 30 hours. All these trains of this class in the United States have buffet-smoking cars, and some also observation cars. Such cars are virtually unknown in Europe.

American and European Sleeping Cars

In addition to open sleeping cars with ordinary upper and lower berths, the better trains in the United States have compartments and drawing rooms with complete toilet facilities, which are roomy and luxurious beyond anything known in continental Europe. The sleeping cars on the continent are all divided into small compartments with upper and lower berths for two, and sometimes three, persons and equipped with wash bowls, the rest of the toilet facilities being at the ends of the cars, and being used by both men and women.

There is one respect, however, in which the sleeping cars of Europe are distinctly superior to those of America. When the berths are made up in the daytime, they afford seats which are much more comfortable than the seats in the American sleeping car. The seats in our Pullman sleeping cars are, in fact, extremely uncomfortable. There is no problem the management of the Pullman Company could solve with more satisfaction to its patrons than that of making its cars as comfortable to ride in by day as are the sleeping cars of Europe. It is curious that this problem should have been solved so much better in Europe than in America, in view of the fact that people ride in sleeping cars by day so much more in America than in Europe. It might be added, in this connection, that the seats in the first and second class compartment of most of the day coaches of Europe are far more comfortable to ride in than the seats in the day coaches of most cars in the United States. In fact there is no means of transportation in the world that is more comfortable than a first class compartment on a European train if it is not overcrowded. The car builders of Europe do know how to make seats to fit the human back—an art that has not been acquired in all parts of the world.

A party of Americans returning from the International Railway Congress had a novel experience on the Rome Express. They left Rome on April 30, and awakened on the morning of May 1 to find that because this was the "Labor Day" of Europe the enginemen and trainmen of the Italian State Railways had "struck work" and left the train in the station at Turin at 4:30 a. m. Here this "crack" train remained until about 6 o'clock a. m. on May 2—over 25 hours. The passengers were not warned before leaving Rome that any such thing was likely to happen; and they remained all day in Turin without any official advice as to when the train would start moving again. The only information they could get was the very unofficial opinion of the sleeping car guards that the "strike" would last 24 hours. The situation was not made less uncertain and exasperating by the fact that other trains were moving in and out of the station all day. Just why other trains ran while the Rome Express stood still it was impossible to learn, but apparently it was because the bolshevistic Italian railway employees desired especially to harrass the "millionaires" who ride on "de luxe" trains.

High Speeds Again Made

It would do injustice to leave the impression that the comparatively slow schedules of the "de luxe" trains to Southern Europe represent the best speeds now being made on the continent. The French railways made high speeds between important points before the war; and in this respect their service has been practically restored to normal. The lines of the Eastern Railway between Paris and Rheims and of the

Northern between Paris and Calais were fought over and largely destroyed repeatedly during the war. Their tracks and their service have been so completely restored that express trains over them in which the writer rode made speeds upward of 60 miles an hour and averaging over 50 miles an hour for long distances with entire comfort to the passengers. The "de luxe" trains also make good speeds on the Paris-Lyons-Mediterranean.

The Cost of Travel

In Europe, as in America, the war caused very large advances in railway rates of all kinds. It has been extremely difficult since the war to state European rates in United States money because of the great fluctuations in the rates of exchange. It would appear, however, from my own computations, based on current rates of exchange that, stated in American money, first-class fares in Europe now average about the same as in the United States. For example, the distance from Cherbourg to Paris is 230 miles, and the rate actually paid in American money was \$7. This makes an average of 3.5 cents a mile. The distance from Paris to Lausanne—partly over the Paris-Lyons-Mediterranean of France and partly over the Swiss Federal Railways—is 348 miles, and the fare paid was \$11.60. This gives an average of 3.53 cents a mile. Computations based on the amounts paid between other points give somewhat similar results.

The cost of a sleeping compartment for two persons for a night trip such as that between Florence and Rome—196 miles—is about \$7 and between Rome and Naples—155 miles—is about \$6. Passengers starting on such a trip, on a train leaving at midnight, cannot get into the car at, say, 10 o'clock and go to sleep, as at many places in the United States. They must get in just before the train starts, and get out as soon as it reaches its destination. A sleeping compartment and lunch and dinner for two persons on the Rome Express costs about \$38, of which about \$6 is for the four meals. Before the war the table d'hôte lunch or dinner served in the restaurant cars of continental Europe cost about 50 cents. Now these meals cost from \$1.50 to \$2. Anybody who studies these figures will conclude that it now costs practically the same to travel first class in Europe as in the United States, and this is true. The increase in the cost of traveling—including emphatically that of staying at hotels—has been, measured in United States money, relatively greater than in America, except apparently in Germany and elsewhere in central and eastern Europe.

Will Not Tend to Increase Good Feeling

Perhaps the facts, based upon personal observation and experience, which have been given in the foregoing will explain why the writer began this letter by implying that this season's invasion of Europe by American tourists will not tend to increase the good feeling between Europe and America. Almost everywhere the American tourist finds expenses greater than he has expected and encounters conditions which cause him discomfort and annoyance. Americans are very far from being as popular in the countries of their recent allies as they were when the war ended; and when they protest and swear about expenses that surprise them and conditions that make them angry they do not increase their popularity. But, as estimated at the beginning of this letter, this American invasion is quite certain at least to have the good effect of making those who participate in it appreciate their own railway service more when they return home.

A NEW ICING STATION of the Southern Railway at Macon, Ga., to facilitate the prompt movement of the rapidly increasing shipments of fruits and vegetables from points in South Georgia and Florida accommodates 26 refrigerator cars at one time, and has an overhead conveyor by which ice is brought directly to the platform from the plant of the Atlantic Ice and Coal Corporation.

Hearing on Power Brakes by Interstate Commerce Commission

IN CONFORMITY to order No. 13528 of the Interstate Commerce Commission, dated February 20, 1922, and supplementary orders in connection therewith, an important hearing in regard to power brakes and appliances for operating power brake systems was started in Washington on Wednesday, May 17. The object of the inquiry and investigation is to determine whether, and to what extent, such brakes and appliances now generally in use on locomotives and cars are adequate and in accordance with requirements of safety, what improved appliances or devices are available for use, and what improvements may or should be made to obtain increased safety in train operation.

Large Attendance at Hearings

The hearing is being held before Examiner Mullen. The air brake manufacturers and the American Railway Association are represented by counsel and on account of the importance of the case the sessions are being attended by from 80 to 100 men, among whom are most of the air brake supervisors of the largest railroad systems.

The first subject taken up was the air brake apparatus which has been developed by the Automatic Straight Air Brake Company, New York. In substantiation of its claims for the need of such a system and that it was superior to the Westinghouse air brake system now in general use, Clark and La Roe, counsel for the Automatic Straight Air Brake Company, have called a number of witnesses and submitted many exhibits. The first witness examined was Robert Burgess, southeastern manager of the Westinghouse Air Brake Company. The questions centered around a paper presented by Mr. Burgess before the Southern and Southwestern Railway Club in November, 1919, relative to the empty and load brake.

The next witness examined was S. D. Hutchins of the Westinghouse Air Brake Company, who was questioned in regard to a memorandum relative to the automatic straight air brake which he sent to M. A. Kinney, superintendent of motive power, Hocking Valley. Mr. Hutchins was followed by W. S. Bartholemew, vice-president, Westinghouse Air Brake Company, who was questioned in regard to a similar general memorandum.

Automatic Straight Air Brake

The next witness called was M. E. Hamilton, field engineer, Automatic Straight Air Brake Company. His testimony covered the operation of the automatic straight air brake both in solid trains and when mixed with Westinghouse brakes, as observed on the test rack and on various railroads where this system has been applied. Evidence showed that an earlier design of the brake was tested on the Virginian in 1918 and subsequently removed. The apparatus of this company is now in service on the following equipment: 100 coal cars on the Norfolk & Western; 40 coal cars on the Denver & Salt Lake; 11 passenger cars on the Chicago & Eastern Illinois; 48 passenger cars on the Erie, and 6 passenger cars on the New York Central. Additional orders now on the books included brakes for the New York, Chicago and St. Louis, Pere Marquette, Rock Island, Erie, Norfolk & Western, Missouri, Kansas & Texas, and El Paso & Southwestern.

A number of enginemen and brakemen of various roads who have operated trains on which automatic straight air brakes were in use have been called to testify as to the operative results obtained.

From present indications it appears that the hearing will be thorough and will last for some time as many additional witnesses are to be called.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended May 13 showed another large increase to 777,359, which was 26,173 more than the loading for the corresponding week of 1921, and an increase of 23,000 as compared with the week before. This was in spite of a reduction as compared with last year of 82,109 cars of coal. With this added to the actual loading the total would have exceeded that for

which showed a decrease of 10,092 cars, and all showed increases over the preceding week except livestock and merchandise, l.c.l.

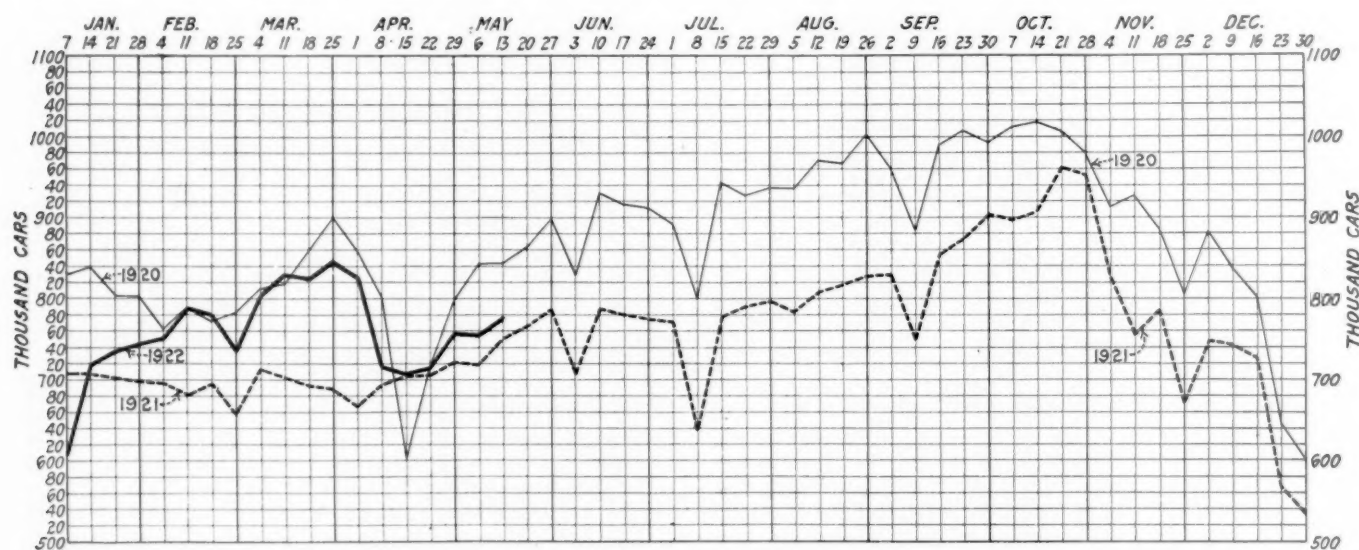
The summary as compiled by the Car Service Division of the American Railway Association is given below:

The number of surplus freight cars for the period from April 30 to May 8 showed a decrease of 18,299 cars, as compared with the period ending April 30, to 353,239. Of these, 86,604 were box cars, a decrease of 8,049, while the surplus coal cars amounted to 226,276, a decrease of 8,801.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, MAY 13, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded		
										This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	10,886	2,878	8,455	1,434	5,857	2,442	70,555	85,132	187,639	.....	.....
	1921	6,402	2,536	45,543	1,130	5,452	2,679	57,174	65,340	.....	186,256	192,921
Alleghany	1922	2,240	2,684	12,866	4,531	3,007	2,758	51,448	66,949	146,483	.....	.....
	1921	1,868	2,545	50,698	2,509	2,129	4,059	43,403	46,330	.....	153,541	175,041
Pocahontas	1922	192	88	28,283	318	1,457	30	6,145	4,163	40,676	.....	.....
	1921	134	75	23,566	201	1,218	19	5,139	3,537	.....	33,889	30,868
Southern	1922	3,192	2,192	21,832	999	19,281	1,064	34,289	46,020	128,869	.....	.....
	1921	3,424	1,832	18,545	760	14,293	818	36,292	33,907	.....	109,871	127,457
Northwestern	1922	10,867	7,926	2,487	1,207	17,656	5,752	30,187	35,604	111,686	.....	.....
	1921	7,838	6,705	4,374	598	14,217	15,414	27,087	29,800	.....	106,033	140,113
Central Western	1922	10,592	11,304	3,232	155	5,872	2,020	32,880	38,970	105,025	.....	.....
	1921	9,659	9,633	14,594	167	5,638	747	31,154	31,798	.....	103,390	114,779
Southwestern	1922	4,301	2,868	2,015	169	7,531	337	15,914	23,846	56,981	.....	.....
	1921	4,775	2,188	3,959	118	6,287	759	16,540	23,580	.....	58,206	61,966
Total Western Dists.	1922	25,760	22,098	7,734	1,531	31,059	8,109	78,981	98,420	273,692	.....	.....
	1921	22,272	18,526	22,927	883	26,142	16,920	74,781	85,178	.....	267,629	316,858
Total all roads	1922	42,270	29,940	79,170	8,813	60,661	14,403	241,418	300,684	777,359	.....	.....
	1921	34,100	25,514	161,279	5,483	49,234	24,495	216,789	234,292	.....	751,186	.....
	1920	30,710	31,403	163,608	9,899	64,428	51,355	156,128	335,614	.....	.....	843,145
Increase compared	1921	8,170	4,426	.....	3,330	11,427	.....	24,629	66,392	26,173	.....	.....
Decrease compared	1921	.....	.....	82,109	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	11,560	.....	.....	.....	.....	.....	85,290	.....	.....	.....	.....
Decrease compared	1920	.....	1,463	84,438	1,086	3,767	36,952	.....	34,930	65,786	.....	.....
May 13	1922	42,270	29,940	79,170	8,813	60,661	14,403	241,418	300,684	777,359	751,186	843,145
May 6	1922	40,125	30,496	75,410	8,124	57,132	11,766	242,945	289,751	755,749	721,722	843,184
April 29	1922	36,398	30,488	75,632	7,952	59,112	14,053	242,565	292,086	758,286	721,084	800,960
April 22	1922	33,271	28,114	63,445	7,609	55,859	9,770	239,484	276,536	714,088	704,632	717,772
April 15	1922	29,869	25,014	62,851	8,072	54,905	7,164	244,228	274,610	706,713	702,116	601,695

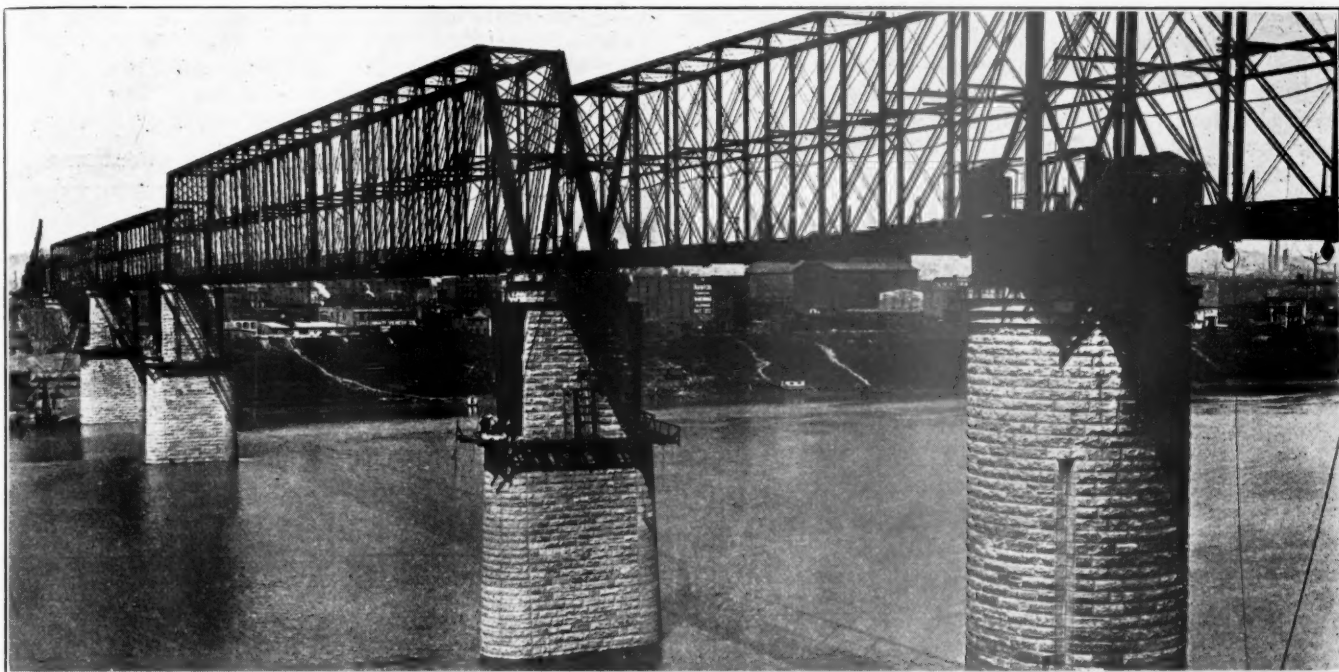


Revenue Freight Car Loadings Up to May 13, 1922

the corresponding week of 1920, which was 843,145. Coal loading was the heaviest it has been since the beginning of the strike and an increase of nearly 4,000 cars as compared with the previous week. All other classes of commodities showed increases as compared with last year, except one,

There was also a decrease in the number of coke and stock cars. For the following week, ending May 15, there was a further decrease in surplus to 343,689.

The number of bad order cars for the two weeks ending May 1 was 327,704, or 14½ per cent.



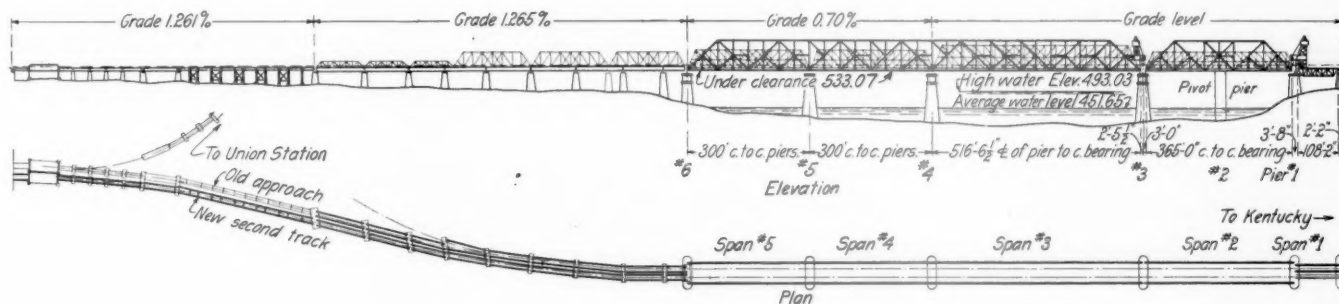
After Supporting These Single Track Spans for 45 Years, the Piers Now Carry a Heavy New Double-Track Superstructure

Double-Track Spans Placed on Single-Track Piers

Utilize Forty-Five Year Old Substructure in Renewal of the Cincinnati Southern Bridge Over the Ohio

THE RENEWAL of the Cincinnati Southern bridge over the Ohio, now nearing completion, is noteworthy as the only large railway bridge project in progress for some time. Aside from this it merits the attention of engineers because of the many original and ingenious methods employed in meeting the problems imposed in this important reconstruction project. Chief among these is the utilization

favorable to cantilever erection. The erection followed the rather common procedure of building the new spans around the old trusses, but according to methods that are essentially original. Provision for a high water channel opening for river transportation requiring a vertical headroom of only 13 ft. more than that afforded by the fixed spans was fulfilled by a 365-ft. vertical lift span, and this short lifting



General Plan and Elevation of the New and Old Structures

of the original piers, built in 1876 for single-track spans, to carry a new superstructure several times as heavy and designed for double-track. This, of course, reflects well earned credit on J. H. Linville, the designer of the original bridge. However, it was only through the exercise of a high degree of engineering skill on the part of those responsible for the reconstruction work that these old piers could be adapted to their present use.

The new superstructure represents the fourth instance of trusses continuous over three or more supports to be built in America during the last five years, a further evidence of the advantages of this form of construction for conditions

distance afforded opportunity for the development of elevating equipment essentially different from that normally employed in bridges of the vertical lift type.

Bridge Owned by City of Cincinnati

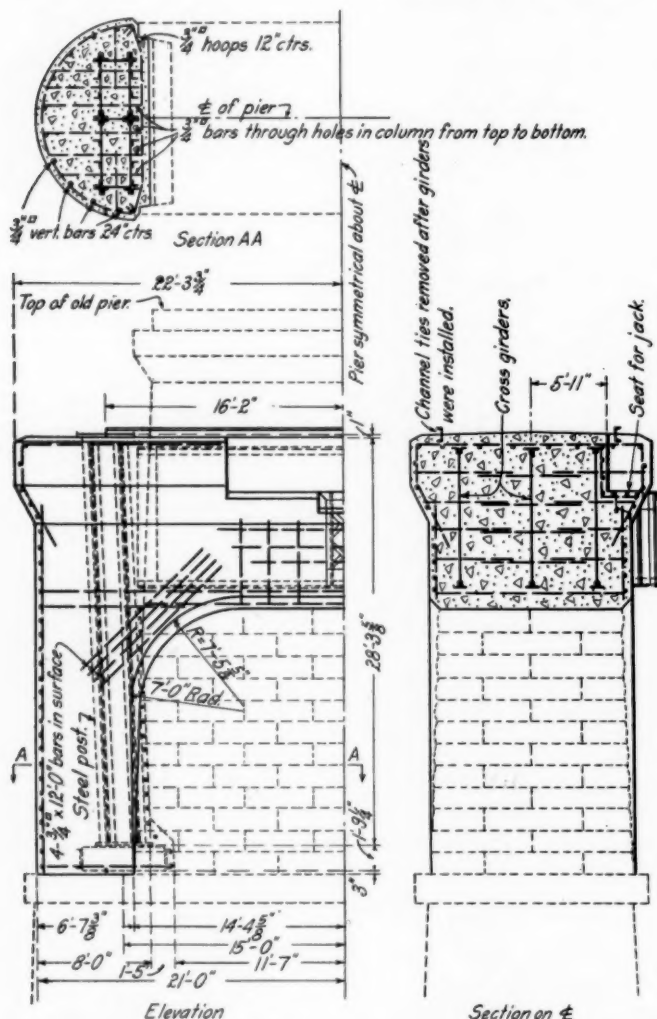
Aside from the structural considerations considerable interest is attached to the Cincinnati Southern bridge because of its ownership by the city of Cincinnati as a part of the Cincinnati Southern, one of the few municipally owned steam railroads in the United States. The property is under lease to the Cincinnati, New Orleans & Texas Pacific, a line controlled by the Alabama Great Southern, which in turn is

controlled by the Southern Railway. The line is operated as a part of the last named system and the bridge renewal project has been financed by the sale of five-per cent gold bonds of the city of Cincinnati, the obligation of which the leasing railroad has assumed by the payment of the annual interest and an annual installment of one per cent against the principal.

The old bridge consisted of four river spans. Two of these were simple fixed spans of 300 ft., the third was a fixed channel span of 519 ft. and the fourth was a symmetrical swing span of 370 ft. center to center of rest piers, this swing span being intended for use at times of high water when there would be insufficient clearance under the 519 ft. span. All of the spans were of wrought-iron, Whipple trusses on

to impose restrictions on the loading of the bridge, as a consequence of which road engines were cut off trains at the south end so that the trains could be hauled across the river by locomotives weighing not over 65 tons. The cars also were restricted to such as had a gross weight not in excess of 115,000 lbs.

As stated above, the bridge has been renewed with a new superstructure on the old piers. In the case of the three fixed spans, continuous trusses have been provided, extending from Pier 3 to Pier 6. In the place of the swing span a vertical lift span has been provided spanning from Pier 1 to Pier 3, thus eliminating the pivot pier. All the spans have been made the same depth, this being determined primarily by the requirements of the long span. The depth was kept the same primarily for convenience of erection equipment operated on the top chords of the trusses. An idea of the difference between the new and the old superstructure is to be had from the cross section showing the plan of erection. The new trusses are nearly twice as deep and are spaced more than twice as far apart as the old trusses. The new spans

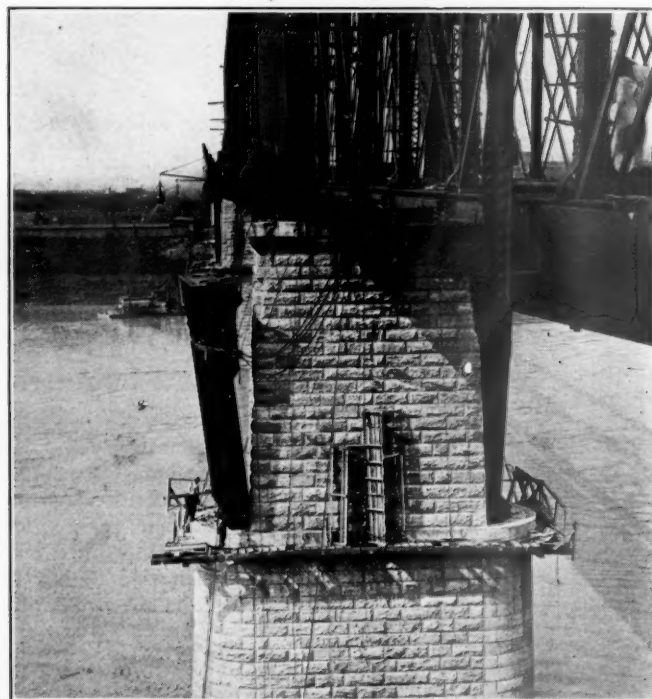


How the Tops of the Piers Were Strengthened and Enlarged to Receive the New Spans

limestone piers carried to rock (blue limestone) foundation by the open coffer dam process. The design and details were of a character such that the construction of this bridge marked an important milestone in the progress of bridge engineering in America, particularly as the 519-ft. span was at one time the longest simple truss span in this country. The south approach comprised one 112-ft. truss span, while the north approach embodied 1,660-ft. of viaduct, partly on masonry piers and partly on viaduct towers.

Use of Old Bridge Restricted

Obviously, a structure designed 45 years ago developed limitations on its loading capacity with increases in the weight of railway equipment. This had made it necessary



Erecting One of the Steel Columns Used to Strengthen the Piers

average 8,200 lb. per lin. ft. of bridge, while the old 519-ft. span averaged 4,500 lb. per ft. of bridge. The design loading for the new span is Cooper's E-60; the old spans were designed for a live load of 1,800 lb. per lin. ft. of bridge.

The spans are riveted throughout except for I-bars in the closing panel of the 519-ft. span and a few diagonals in the web system. The main panel lengths are about 74 ft., so that with subdivided panels the stringer span is 37 ft. All riveted members except the bracing are of silicon steel. The I-bars are heat-treated, high-carbon steel.

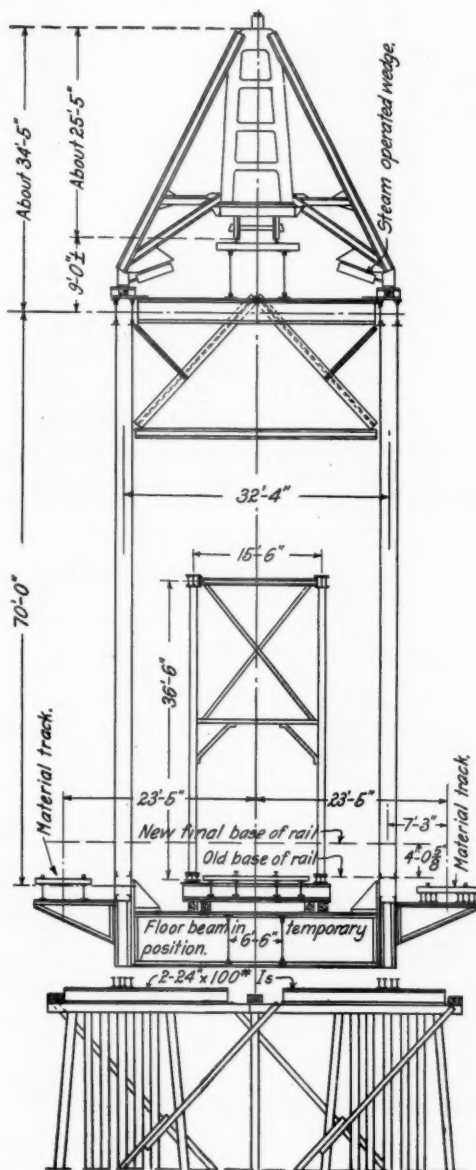
In the north approach, the old through truss spans have been replaced by deck plate girders on masonry piers for double track, covering a total length of 921 ft. Of these the longest span is 120 ft. For a length of 658 ft. the existing single track viaduct is supplemented by a new single track viaduct alongside.

Spans 1, 2 and 3 of the bridge are level; the other two spans are on a grade of 0.7 per cent rising to the south. Owing to the fact that the floor of the new bridge is four feet deeper than the old floor and it was necessary to maintain the

established under-clearance, the track grade on the new bridge is four feet higher than on the old one. This necessitated considerable change in the viaduct structure which was subjected to further change because of a raise of seven feet in the grade of the approach at Gest street, where a new reinforced concrete viaduct has been provided. The entire project required the fabrication and erection of 8,200 tons of structural steel, of which 3,914 tons are in the three con-

ting coping was removed and enough of the pier ends cut away to make room for heavy steel columns and grillage footings to take the end bearings of the new trusses. To apply the load as far from the end of the pier as possible, these columns were inclined inward so that the bases are 14 in. closer to the center line of the bridge than the tops of the columns, the resultant outward thrust at the top being resisted by tie members extending across the faces of the piers and connecting the tops of each pair of columns. However, application of the superstructure load is to be further distributed (following the removal of the old spans) by taking down enough of the pier top between the columns to permit the introduction of three cross girders. These will serve as diaphragms connecting the two columns of each pair and will be wedged up on the masonry so that a considerable portion of the column load will be distributed to the center portion of the pier.

The top of the piers will be jacketed with concrete to enclose the structural steel and provide a bridge seat and

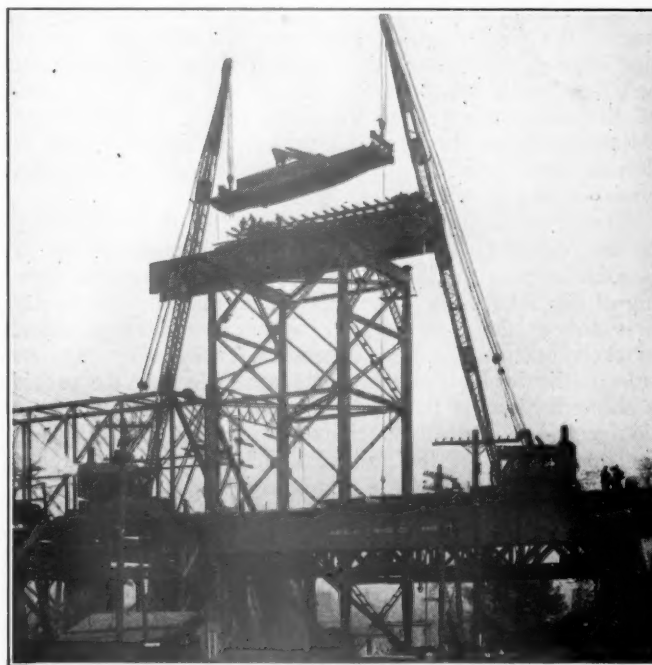


How the New Superstructure Was Erected Around the Old

tinuous spans and 1,251 tons are in the lift span, exclusive of the towers and machinery.

Work on the Piers

To support trusses spaced 32 ft. 4 in. center to center on piers having a top length of only about 28 ft. over the coping was by no means the least of the problems imposed in the renewal of the bridge. Fortunately, the over-all length of the piers at the top of the starling, 30 ft. below the coping, was about 42 ft., thereby offering a solution in the reconstruction of the pier above that point. The great concentrations to be imposed by the new span, together with the need of supporting the existing span during erection of the new work, called for the use of structural steel bents as a means of applying the new load to the piers. The star-



A Delicate Piece of Erection—Setting One of the Derrick Cars on a Scaffold So That It Will Lie in Position to Run Out on the Top of the New Superstructure

coping. The drawing shows how this will be accomplished with a maximum consideration of the finished appearance of the pier.

At Pier 3 an additional complication is introduced in providing a seat for the lifting equipment required for the movable span. This necessitated a pair of cantilever girders projecting from the side of the pier as shown in the drawing. Pier 1 at the south end of the lift span is on pile foundation and has been completely encased in a heavy concrete jacket, also on pile foundation.

Erection Methods Original

Spans 2 and 5 were erected on falsework while Spans 3 and 4 were erected by the cantilever method with the closure in the center of Span 3. The use of continuous trusses for Spans 3, 4 and 5, provided the necessary continuity over Piers 4 and 5 for erection purposes. This was provided over Pier 3 by temporary connections between the top chords of Spans 2 and 3. As shown in one of the photographs, this consists of girders provided for use in the north approach viaduct equipped with temporary end details as re-

quired for pin connection to the hip-joints of the two adjacent spans.

Obviously, the cantilever method of erection imposed conditions requiring the erection equipment to travel on the top of the structure, but instead of using a creeper traveler running on the top chords, two standard-gage, 60-ton bridge derrick cars with 70-ft. booms were used for this purpose, traveling on a track supported by a floor system composed of bridge stringers spanning between the cross struts of the top lateral bracing. These were the stringers provided for the two outside lines of the stringers in the floor system, as only the two inside stringers were erected at once in final position. The only special equipment provided for the derrick cars was an A-frame designed to provide side bearings and tie downs on the top chords when loads were being lifted. The application and release of the side bearing was accomplished by hydraulic-operated wedge blocks as shown in the drawing and photograph.

The placing of these two derrick cars in position to start work at an elevation 74 ft. above the track level on the old bridge was no mean problem. It was solved as shown in one of the photographs. Four-post platforms were erected just beyond the ends of the two end spans with their tops at a level with the top of the new spans and the first pair of girders for the erection track was placed on these towers, following which the ties and rails were installed and the derrick car assembled piecemeal with the aid of locomotive cranes equipped with 110-ft. booms.

The material for the new trusses could not be delivered on the operated track of the old bridge because it was impossible to pass the large chord members through the framing of the old trusses. For this reason material tracks were provided at the level of the bottom chords on cantilever brackets outside the new trusses on either side. On one side of the bridge these brackets were necessary to provide a sidewalk, but on the other side they served only for erection purposes. In all 801 tons of structural steel was used for the erection of this bridge which was not required in some way as a part of the permanent structure. The mate-

time came for wrecking them. These beams and two lines of stringers were assembled complete in the temporary position with the bottom lateral system and the beams were equipped with special brackets to receive the lateral plates in the absence of the bottom chords, while short diagonal struts were introduced to connect the bottoms of the floor



The New Cross Bracing Had to Lie Erected in a Temporary Position to Clear the Old Spans

beams with the chord members as a means of transmitting the longitudinal thrust of the lateral system into the chords.

This plan had to be modified to some extent in the end panels of the trusses owing to the fact that end floor beams could not be inserted because of interference with the bridge piers. These beams were omitted until the old trusses were removed and the piers cut down as previously explained.



Closing the Gap in Span 3—Note the Kinks in the Bottom and Top Chords at the Ends of the Closing Panel

rial was delivered on these material tracks on standard-gage cars, but to avoid undue loading a light narrow gage locomotive was used to handle the cars. This necessitated the use of a third rail in the material tracks and an offset coupling for connecting the locomotive with the cars.

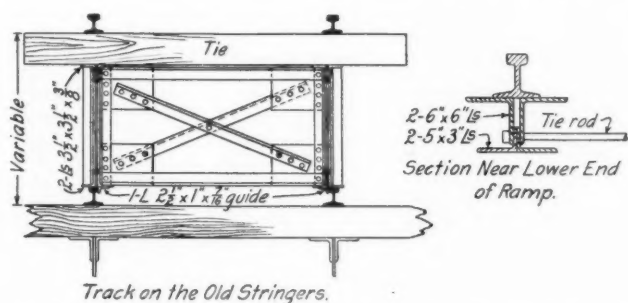
The erection of the new span around the old one introduced certain complications to avoid interference of the new members with portions of the old structure. The floor beams had to be erected so as to hang below the old floor and thereby provide a means of supporting the old spans when the

The portals and cross-frames also interfered with the old trusses, as a consequence of which the upper portions of the cross-frames were omitted temporarily and the lower portions erected in a raised position. This is clearly shown in some of the photographs which show only the lower part of the X-bracing in position.

How Span 3 Was Closed

Extensometer measurements were made in the top chords of the trusses over Piers 4 and 5 during the course of erec-

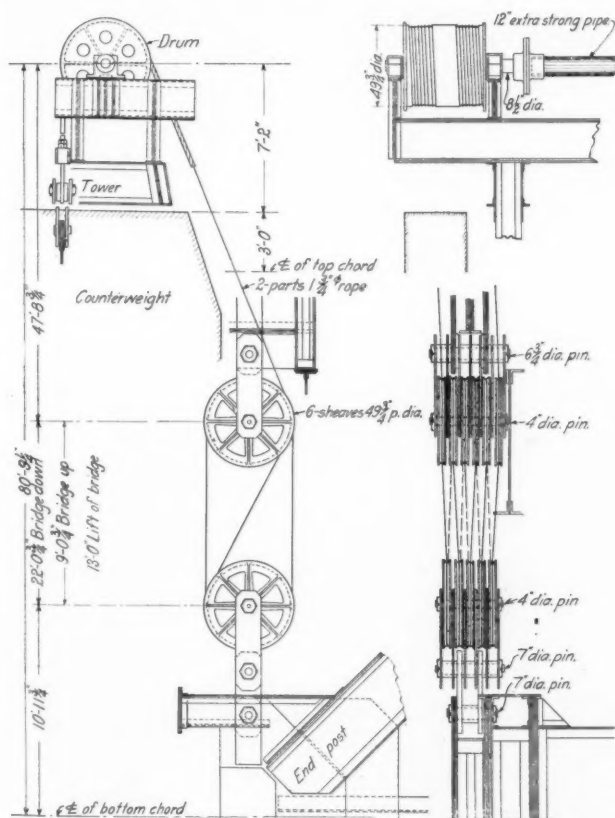
tion and the results checked very closely with the calculated stresses for various stages of the work. Thus, readings of 26,000 lb. per sq. in. were obtained for conditions under which the calculated stress was 25,000 lb. per sq. in. The adjustment of bearings on Span 4 after the erection had reached Pier 4 was accomplished by the use of jacks at that



Two Sections Through the Ramp Used While the Old Floor System Was Being Removed

pier, after which no changes were made in the levels at Piers 4, 5 or 6 in connection with the closing of Span 3. This was accomplished entirely by adjustment in elevation at Pier 1 in connection with a unique method of inserting the members in the closing panel.

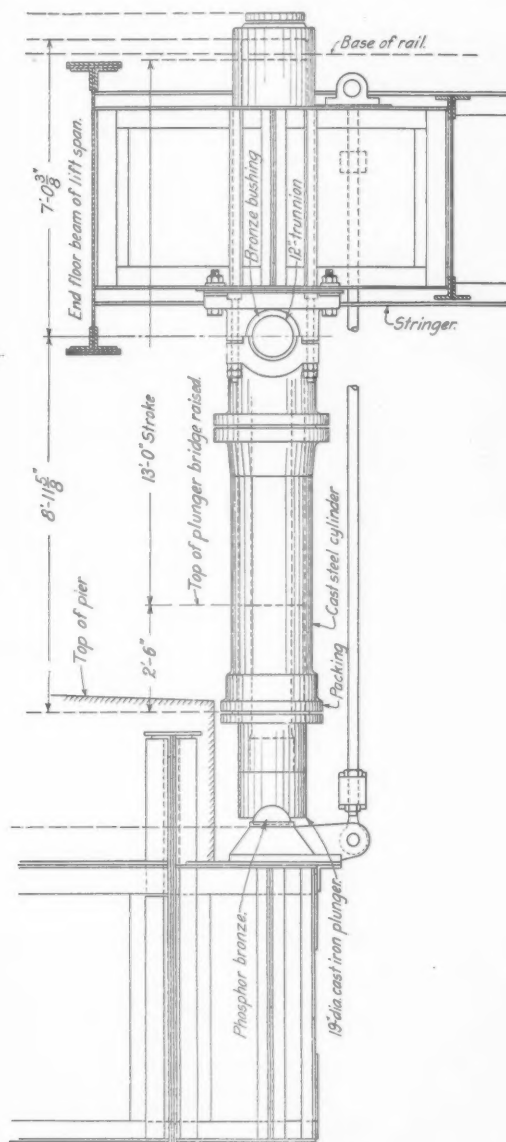
The closure was made in the central panel on this span



**The Counterweight Rig for the Lift Span Is Arranged to Give
a Five-Time Multiplication (Copyright American
Bridge Company)**

as shown in the photograph, the closing members comprising bottom chord eyebars and diagonals with slotted pin holes and a top chord member having butting ends planed on a slight chamfer so that only about the middle third of the member was in bearing. As erected the outer end of the north cantilever was below final position, while the outer

end of the south cantilever was above final position through the adjustment of jacks at the south end of Span 2 on Pier 1. This arrangement allowed a sufficient clearance for the entrance of the closing members in the gap between the ends of the two cantilevers. With the members in position the south end of Span 2 was slowly raised, thus lowering the end of the south cantilever. This action served to shorten the top chord length and gradually introduced compression in the closing member of the top chord. This in turn served to raise the outer end of the north cantilever until Span 3



Details of the Jack Provided to Operate the Lift Span (Copyright American Bridge Company)

gradually assumed the elastic curve for the condition of continuity over Pier 4 and simple support at Pier 3.

Following the erection of the new trusses complete the old spans were blocked up on the new floor and the old trusses cut apart and removed. The members were lowered and loaded by the derrick cars from the erecting track on top of the new spans, the material being loaded on to cars standing on the operated track within the bridge. After this work was completed there remained the removal of the old floor and the raising of the new floor to the final level. This work was carried on simultaneously for about four stringer panel lengths at a time, making two or three changes per week. This was complicated by the fact that there was

a difference of four feet between the new and old rail levels, this difference being taken up temporarily by a ramp 150 ft. long, supported on the top of the rails of the old floor and shifted forward each time that a section of the floor was changed. Each time that a change of floor was made the new floor was supported at each panel point by fall lines, while the floor beams were disconnected from the posts. This completed, they were hoisted to the new level, carrying up the old floor system with them. The old floor beams had previously been cut off close to the stringers at each side and had been cut in two between the stringers. The track was then hoisted clear of them and the old stringers were "snaked" out from under the floor on either side, after which the track was let down onto the new stringers.

This process was complicated to some extent at the piers where the new floor could not be installed complete at the lower level as previously explained. This change in floor system was made at intervals between trains and was handled without interference with traffic.

Lift Span of Unusual Design

One of the unique features of the bridge is the lift span for the high water channel between Piers 1 and 3. The lift is only 13 ft., but the piers supporting the span are relatively high in proportion to the lift. Advantage has been taken of these conditions to introduce several innovations, chief among which is the provision of hydraulic power in the form of two large jacks or rams for the lifting equipment, these jacks being of sufficient power to lift one-half the weight of the span owing to the fact that the span is counterbalanced for only one-half its weight. Another interesting detail is the use of multiple part counterweight tackle, as a result of which half the weight of the span is counterbalanced by counterweights weighing only one-tenth the weight of the span. This, of course, implies that the travel of the counterweights is 65 ft. for the 13 ft. travel of the span. The jacks are cast steel cylinders 19 $\frac{1}{4}$ in. in diameter receiving cast iron plungers. One of these jacks is mounted on the center line of the span at each end of the bridge so as to exert a thrust between the loading pocket

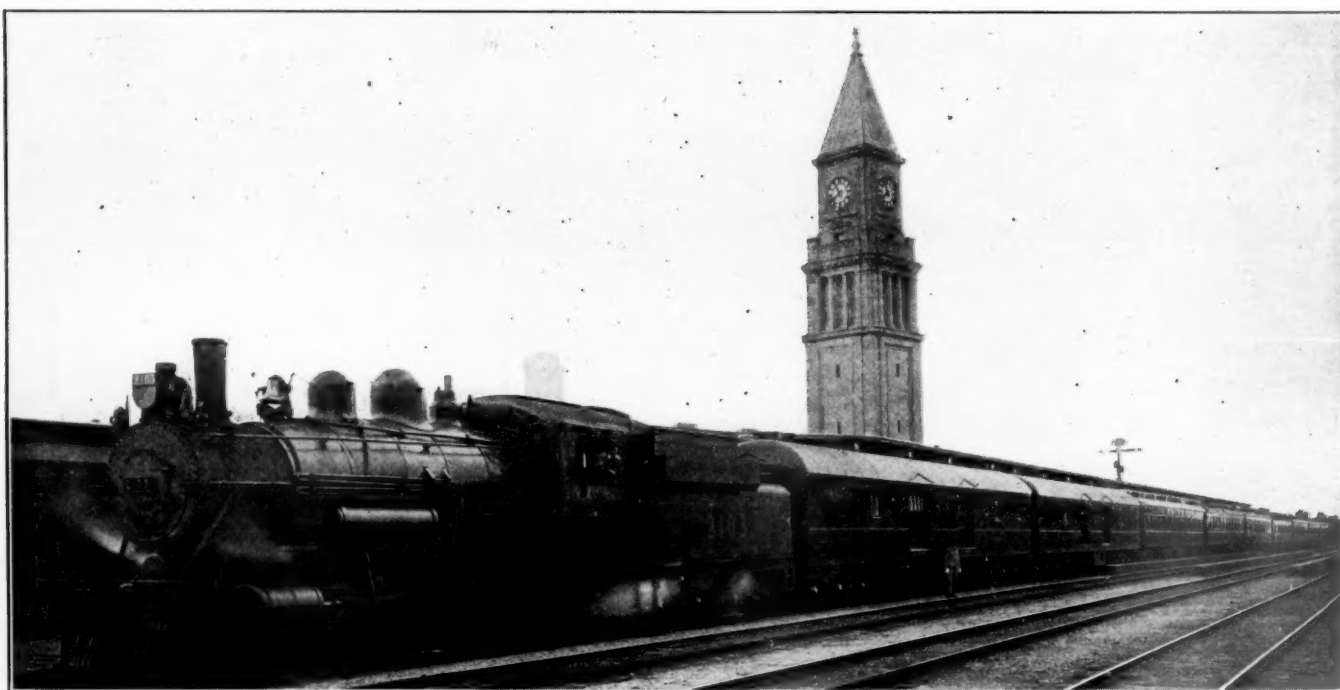
on the pier and two loading girders set between the two inside stringers of the end panels of the span.

To allow for change in the length of the span due to changes in temperature the rams are hung in trunnions 12 in. in diameter attached to the loading girders with a hinge joint at the bearing in the loading pocket. The jacks will be operated by oil at a pressure of approximately 3,000 lb. per sq. in., the pressure being supplied from a pump located centrally in the span from which pipes will be connected to each jack through the center of the trunnions. To guard against dropping the span in case of failure of the pumps or the circulating pipes, check valves are placed in the pipes close to each ram. The estimated time for raising the span is five minutes.

Work on the reconstruction of the bridge was started on March 1, 1921, beginning with the construction of the approach piers. This work proceeded to a point where the steel reinforcement of the river piers could be inserted by July 1. The erection of the new trusses, which was started on September 26, progressed continuously and was virtually completed with the closing of the channel span on December 21. Following this, work was started on the removal of the old span, which was completed on February 1, except for the changes in the floor system.

The entire reconstruction project has been carried on under the direction of Ralph Modjeski, consulting engineer, Chicago. The interests of the railroad company are represented by T. H. Gatlin, chief engineer of construction, Southern Railway, Washington, D. C. M. B. Case was the resident engineer for Mr. Modjeski until December, 1921, when he was appointed senior resident engineer on the Delaware River bridge at Philadelphia, Pa., and was succeeded at Cincinnati by Charles Hahn. The new superstructure was fabricated and erected by the American Bridge Company, Emil Larsson, assistant chief engineer.

TWO THOUSAND EMPLOYEES of the Georgia Southern & Florida held their annual picnic at Valdosta on Saturday, May 20. Automobiles to carry the visitors from the railroad station to the fair grounds were furnished by the Rotary and Kiwanis clubs.



A Transcontinental Train on the Canadian Pacific

I. C. C. Prescribes 10 Per Cent Rate Reduction

Credit for Decreases Already Made Reduces Estimated Cut
to \$225,000,000—Rate of Return Fixed at 5.75 Per Cent

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION made public on Wednesday morning, May 24, its long awaited rate decision, in which it finds that $5\frac{3}{4}$ per cent on the aggregate value of the railway property will be a fair return after March 1, 1922, and that existing freight rates and charges, including charges for switching and other accessorial service and all other charges applicable to freight service which were increased in Ex Parte 74, will be, on and after July 1, unjust and unreasonable to the extent that they may respectively include more than stated percentages of increase over the rates in effect prior to August 26, 1920. The new percentages prescribed effect a general 10 per cent reduction except that rates reduced as a result of the commission's decisions in the western grain and livestock cases and the southern hardwood lumber case and by the voluntary 10 per cent reduction on agricultural products made by the carriers, are not to be further reduced, but are continued in effect. Where rates have been changed since August 26, 1920, primarily by way of readjustment to remove discriminations, prejudices or discrepancies without material effect upon the aggregate level, the 10 per cent reduction is to be applied to the new rate in order to preserve relationships. A 10 per cent reduction on all freight revenues would amount to approximately \$400,000,000. It is estimated that the exceptions and reductions already made will decrease the amount of the reduction now proposed to about \$225,000,000 a year. The reduction in the rate of return reduces the amount which the commission finds should constitute a reasonable net operating income for the carriers from \$1,134,000,000 to \$1,086,000,000.

Decision Dated May 16

The decision bears the date of May 16, indicating that it was reached prior to the President's conference with the railway executives at dinner at the White house on Saturday evening, at which he and Secretary Hoover urged the railroads to make voluntary reductions on certain basic commodities. It has been stated officially at the White House that the commission could not on the record made in its general rate investigation apply the amount of the reductions which it found warranted to specific commodities only, but must apply them generally and that the carriers had been offered an opportunity to substitute an immediate voluntary reduction for one to be ordered by the commission. The commission's report is not in the form of an order, but states that the respondents should advise it promptly and not later than May 31, if possible, whether its findings will be carried into effect without formal order or orders. A committee of railway executives appointed following the White House dinner which had conferred with the commission on Monday morning was to meet with the commission again on Thursday and apparently the decision leaves it open for them to propose a program of voluntary commodity reductions as a substitute for a general order. The commission's report contains no indication as to how such a proposal would be regarded, however, and statements from the White House indicate that the President was not optimistic following his conference with the railroad executives that they would be able to reach an agreement that would comply with the wishes of the administration for substantial reductions on basic commodities rather than a smaller reduction spread over all traffic.

The commissioners were unanimous that rates should be re-

duced and the majority opinion finds that the reductions should be general. Four of the commissioners, however, in concurring and dissenting opinions, favored reductions on basic commodities. Commissioner Eastman expressed the opinion that the decision should have been deferred until after the Labor Board has acted. The majority opinion finds no reductions in passenger fares warranted, but Commissioners McChord, Potter and Cox thought that passenger rates should be reduced.

Fair Return 5.75 Per Cent

The 10 per cent reduction is proposed to be effected by the findings that rates will be unreasonable to the extent that they exceed more than 26 per cent above the rates in effect on August 25, 1920, in the eastern group and between points in Illinois territory and between Illinois territory and the eastern group, instead of the 40 per cent increase authorized in Ex Parte 74. In the western group and between the western group and Illinois territory the 35 per cent increase of Ex Parte 74 is reduced to $21\frac{1}{2}$ per cent. In the southern and Mountain-Pacific groups the 25 per cent is reduced to $12\frac{1}{2}$ per cent and on interterritorial traffic the $33\frac{1}{3}$ per cent is reduced to 20 per cent.

The commission finds that such rates will enable the carriers in the respective rate groups under honest, efficient and economical management, with reasonable expenditures for maintenance of way, structures and equipment, to earn an aggregate annual net railway operating income equal as nearly as may be to a return of 5.75 per cent upon the aggregate value as taken for the purpose of this proceeding and the railway property of such carriers held for and used in the service of transportation.

The majority opinion says that a fair return of 5.75 per cent, representing income arrived at after deducting the federal income tax on a return of 6 per cent, would be approximately the equivalent of a fair return of 6 per cent, out of which the federal income tax was payable. Commissioner Potter, in his concurring opinion, says the rate should have been fixed at 6 per cent.

The commission finds that since the advance of August, 1920, the carriers have failed by a considerable margin to earn the authorized return. Not that it appears reasonably certain, with increased traffic and lowered operating expenses that the net railway operating income of the carriers in 1922 would be more favorable under present rates than in 1921. The commission does not find that the high rates caused the business depression. "Manifestly," it says, "the depression of 1921 resulted primarily from causes other than transportation charges, but it does not follow that under present conditions existing high rates do not tend to retard the return to a more normal flow of commerce. We are of the opinion that general reduction in the rate level as substantial as the condition of the carriers will permit, will tend not only to lessen the transportation burden, but also to equalize and stabilize the condition under which commerce and industry are carried on, with consequent full assurance to the carriers of realizing the fair return contemplated by the law." An abstract of the report follows:

Report of the Commission

The important questions for determination are whether present rates, fares, and charges, in the aggregate, as a whole or in the several rate groups defined in Increased Rates, 1920, or upon

specified commodities or descriptions of traffic, are or will be unreasonable under section 1 or other provisions of the act; whether such rates, fares, and charges are those which will most nearly produce a fair return, as provided in section 15a; and what the fair return shall be on and after March 1, 1922. When this proceeding was instituted there were pending before us several petitions filed by carriers and by various organizations of shippers in which we were asked to enter upon general investigations into the reasonableness of existing rates and charges.

In *Increased Rates, 1920*, supra, we designated rate groups and authorized substantial increases. Late in that year there developed a pronounced and long-continued business depression, nation wide, a phase of the general post bellum adjustment throughout the world. Practically all traffic and all industry have been affected. There has been substantial reduction in the price of most commodities without a corresponding reduction in rates. There is a definite conviction in the minds of the shipping public that the present rate level is unreasonably high, is an effective barrier to the return of business activity, prosperity, and the usual volume of traffic, and that it should be substantially reduced.

Fair Return

Since August, 1920, the carriers have failed by a considerable margin to earn the authorized return. It is urged by some that under existing conditions the question of a fair return for the future is academic and that it is not necessary for us to determine a percentage of return at this time. We do not take this view. The operation of economic forces which have prevented, or which may hereafter prevent, carriers from earning a fair return under the adjustment of rates then prevailing does not constitute a bar to determination of what a fair return should be. By the qualifying words "as nearly as may be," Congress recognized that conditions during certain periods might prevent such realization under any adjustment of rates.

The determination of what will constitute a fair return is, in our judgment, a function distinct from that of initiating and adjusting rates. Section 15a, reasonably construed, contemplates the determination of a return which the carriers, collectively or in rate groups, may attain over a period of time under rates adjusted from time to time with that object in view. The phrase "from time to time" does not mean that we should adjust and readjust rates to meet business fluctuations. Whether carriers may be able to earn an aggregate net railway operating income equal to a fair return must depend to a large extent upon business conditions.

We have before us a practical problem. The record emphasizes the need of a constant influx of capital to meet the country's growing transportation needs. In the 10-year period ending June 30, 1916, a period of relatively low costs of materials, supplies, and labor as compared with present costs, there was a net addition to capital account for new lines and extensions, additions, betterments, and general expenditures properly chargeable to that account which aggregated about $5\frac{3}{4}$ billion dollars, or an average of 574 millions per annum. According to an exhibit of the carriers, expenditures for such purposes in the 12 months ended September 30, 1921, aggregated about 365 millions, an average of 1 million a day. This omits certain roads not reporting. The carriers estimated that, based on the volume of traffic which they were then handling, capital expenditures in the year 1922 should approximate 458 millions, and that if transportation facilities are to be expanded in 1922 as they should be to provide for a materially increased volume of business, the expenditure this year should be approximately 858 millions, or an average of 2 1-3 million dollars a day. Others estimate lesser amounts. Some authorities on transportation and economic conditions place the requirements for the next few years at even higher amounts, to come in part out of earnings, and predict that, unless there is immediate resumption of new construction, a return of anything like normal business will result in "strangulation for lack of transportation." Others are of opinion that the existing transportation machine, if properly maintained, with necessary additions in the way of terminals and trackage facilities, is adequate to handle the business which may reasonably be expected in the immediate future.

It is obvious that large additions to capital must continually be made. The carriers must attract money by rates of return and stability of investment. While return must not exceed a reasonable charge against the public served, it must be such as to obtain the needed new capital. It is necessary to determine and make public, as required by section 15a, a percentage of fair return. Determination of the percentage implies, or carries with it, no guaranty. Read in connection with the provision for recapture of one-half of the excess above 6 per cent is, instead, a limitation.

Because the yield on some railroad bonds has declined to something over 5 per cent it does not follow that a fair return should approximate that percentage. We do not deal alone with interest rates on mortgage obligations, or with the more favorably located and prosperous carriers whose credit conditions may enable them to obtain money at relatively advantageous rates. In the recap-

ture provisions Congress recognized that uniform rates on competitive traffic which would adequately sustain all the carriers would produce substantially and unreasonably more than a fair return for some carriers. We should not take the few, and the highest type of their securities, as the basis for determining what shall be a fair return for all. It can hardly be disputed that the carriers of this country should not continue to provide for all needed capital by successive bond issues. In such a process eventually a point must be reached where no new capital can be raised, except for short terms at high rates. No substantial proportion of the new capital has been raised by issuance of stock since 1907.

Notwithstanding the failure of the carriers to earn the 6 per cent allowed in the first two years of operation under section 15a, there is an upward trend in railroad securities, which share in the improved conditions that have prevailed generally in the money market. This is urged upon us as an argument for reduction in the percentage to be determined. Other elements, however, are to be considered. The intent of Congress was to create a steady and reliable flow of money "for enlarging such facilities in order to provide the people of the United States with adequate transportation." A substantial reduction in the percentage of return might be unsettling in its effect, particularly in light of the fact that the return allowed in 1920 was not realized. The fact that a utility may reach financial success only in time or not at all is a reason for allowing a liberal return on the money invested in the enterprise.

In numerous cases cited, courts and regulating authorities of states have recognized that public utilities and railroads may be permitted individually to earn under reasonable rates at least 6 per cent upon fair value. In some instances higher rates of return have been approved. But we are here considering return upon "the aggregate value of the railway property."

The interstate commerce act in many provisions other than those quoted indicates that 6 per cent may be regarded as a fair return. Paragraph (6) of section 15a provides for the disposition of net railway operating income in excess of 6 per cent of the value of the property held for and used in the service of transportation. One-half of the excess goes into a reserve fund, which may be drawn upon for certain purposes, in accordance with paragraph (7), when net railway operating income for any year is less than a sum equal to 6 per cent upon the value. Under paragraph (12) we may make loans from the general railroad contingent fund, such loans to bear interest at the rate of 6 per cent per annum. Under paragraph (14) we may lease equipment or facilities purchased from the general railroad contingent fund, the rental charges to be at least sufficient to pay a return of 6 per cent per annum plus allowance for depreciation. That Congress by direct legislation fixed the fair return for the period of two years beginning March 1, 1920, at the rate of $5\frac{1}{2}$ per cent, to which, in our discretion, we might add not exceeding one-half of 1 per cent, is a matter which may fairly be considered in the determination of the rate for the period immediately ensuing. But, taken in connection with the other provisions of section 15 (a), it does not constrain us to consider $5\frac{1}{2}$ per cent as maximum in determining a fair return for the ensuing period.

Railway Property Value

In the instant proceeding there is little of record which goes directly to the subject of value. There has been a general acceptance by carriers and shippers of the value taken in our former determination as an appropriate basis for the purposes of the present proceeding. The carriers have not attempted to show that that value should be increased, other than by appropriate consideration of the subsequent increments to the transportation plant. We have before us deductions made by certain of the state commissions and shippers, based upon the results of the valuation work under section 19a so far as announced, and also computations based upon the market value of outstanding stocks and bonds.

More than 20 months have passed since our former determination, and in that period the valuation of the railroads under section 19a has gone forward. The work is still incomplete, but has progressed to such an extent that we may accept the results with fuller assurance, both as to particular roads and as showing general trends and principles. In our administration of various sections of the act, and in our certification of standard return for the purposes of the federal control act, we have had occasion to make further investigation and corrections of investment accounts of the carriers.

The various other values and elements of value, as set forth in *Increased Rates, 1920*, supra, have been re-examined in the light of the present record and the requirements of section 15a. We find no present reason to disturb the value taken by us in that proceeding as approximating the sums there stated, except to the extent that subsequent additions to or withdrawals from the property in service, including materials and supplies and working capital, and further depreciation, made adjustment necessary. Whether the value taken by us in 1920 should stand without con-

sideration of these later items or not, the difference would be reflected only in fractions of per cents of the returns hereinafter indicated as the results of operation.

Revenues and Expenses

The net railway operating income for 1921 of Class I carriers, including large switching and terminal companies, yielded returns of 3.30 per cent in the eastern group, 2.60 per cent in the southern group, 3.50 per cent in the western and mountain-Pacific groups, and 3.31 per cent for the United States as a whole, on the valuation for all roads taken by us, for the purposes of that proceeding, adjusted by the carriers to cover Class I roads only, together with additions and betterments on Class I roads aggregating \$605,000,000 for the year ended December 31, 1920.

The decrease in net railway operating income shown between October, 1920, and July, 1921, was due to decline in traffic. The marked increase in that income during the last six months of 1921 was due to increased traffic and lowered operating costs. Deficits were experienced in January and February, 1921, in the eastern group and in January, 1921, in the western district. In the southern group the rate of return in those months was less than 1 per cent, although the tonnage handled in January was high as compared with the remainder of the year, bearing in mind ordinary seasonal variations. Ordinarily, except in the southern group, traffic begins to increase in the spring months and reaches its peak in the harvest months, August to October. In the south traffic during the summer months is light and the heavy months are October, November, and December. The principal reductions in costs accomplished during 1921 were brought about by reductions in force, wage reductions ordered by the Railroad Labor Board effective July 1, and gradually receding prices of materials and supplies. As the combined result of the higher level of rates, fares, and charges and of these reductions in operating costs, the net railway operating income of the carriers as a whole for 1921 was substantially greater than that for 1920, although the ton-mileage in 1921 was less than in any year since 1915 and approximately 25 per cent below that of 1920.

Efficiency and Economy in Operation

One of the matters for consideration is the extent to which net income can be increased by enhanced economy and efficiency in operation. The record indicates that the railroads individually, and collectively through their associations, have been and are devoting their attention to this matter. Substantial progress has been made in standardizing the various parts of equipment, thus increasing their interchangeability and promoting economy in equipment repairs. Committees of these associations are engaged upon plans to lower the unit cost of car repairs, fuel, and other items, and to reduce loss and damage. The evidence indicates realization of certain savings and improvements in operation. We are investigating methods of increasing economy and efficiency of operation.

During the war various governmental agencies, in co-operation with shippers, brought about material increases in car loading. The carriers direct our attention to the fact that the loading per car during the 12 months ended September 30, 1921, was 28.5 tons, which is substantially the same as that during the war years. Since February, 1921, for various causes, some of which are temporary in character and beyond carriers' control, the average car loading has declined.

The percentage of empty-car mileage to loaded-car mileage was greater during the 12 months ended September 30, 1921, than during any corresponding period within the past nine years. The carriers' existing car-service rules are based upon ownership and control by each carrier of its cars. The increase in the movement of empty cars resulted from the carriers' practice, then, and now, of returning cars empty to the owning carrier when loads are not available. The business depression which then prevailed prevented the usual number of loaded movements, and thus brought about the increase in empty-car mileage.

Representatives of owners of railroad securities appeared and urged adoption of a plan which contemplates co-ordination and unification of operations of carriers, more particularly with respect to the purchase, repair, distribution, and control of freight cars. Respondent carriers introduced little testimony with respect to this plan and gave no indication of intent to adopt any similar plan. It is evident that the full economies predicted would not be immediate, that there would be difficulties in attainment, and that heavy expenditures of capital would be required. If the purpose of section 15a to afford carriers a reasonable return is to be attained, earnest efforts toward reduction of operating expenses in all possible ways consistent with good service must be continued. The far-reaching importance of such proposals calls for a more intensive study by carriers and the proponents than appears to have been made.

Consideration is being given by the carriers to co-operation in the use of facilities. The joint use of facilities established dur-

ing federal control has been continued in many instances, and some progress is being made in the direction of further co-operation. The record does not disclose any general lack of efficiency.

Maintenance

The significance of the return of 3.31 per cent given above for Class I railroads during 1921 depends to a considerable extent on whether the maintenance charges for that year represented adequate upkeep. Certain executives testified that the net railway operating income which resulted from the operations of 1921 was obtained only by forced economies which are neither in the public interest nor susceptible of indefinite continuance; that these economies took the form of inadequate maintenance; that the hours of labor consumed and the quantities of material applied in maintenance of way and structures on certain lines was less in 1921 than during the average of years in the test period; and that in general no more was done than was necessary to keep the lines in a condition safe for operation.

The carriers generally seem to have taken the fact of under-maintenance during 1921 for granted rather than to have undertaken to prove it. Individual carriers have proved its existence in their own properties. Maintenance charges of Class I roads aggregated \$2,017,700,867 in 1921, more than in any preceding year except 1920, when the total was \$2,623,985,448. The decrease of 1921 under 1920 was \$606,284,581, or 23.1 per cent. The volume of traffic in 1921, as measured by ton-miles, was about 25 per cent less than in 1920. Unusual features in the operations of 1920 make that year unreliable as a measure of what the annual outlay for maintenance should be. It was a period of peak prices, when the greatest ton-mileage and passenger-mileage in the history of the railroads moved under most adverse conditions. Moreover, labor and material costs were lower in 1921 than in 1920. In relation to total operating expenses, maintenance charges in 1921 were almost the same as in 1920, the percentages being 43.6 and 44.1, respectively.

The record does not disclose whether the actual quantities of material applied were as great in 1921 as in previous years. It does not appear that, taking the country as a whole, such applications in 1921 compare unfavorably with those of 1920, or of the test period. Returns from carriers representing more than half of the tie and rail applications for 1920 indicate that their 1921 applications are within 1 per cent of those of 1920, the East and South being greater than in 1920, and the West being less. In a year in which the movement of traffic is light, somewhat less maintenance is required than in years of heavy traffic, although it would be in the public interest if surplus from prosperous years were expended on maintenance in years of light traffic.

When we consider the conditions which prevailed during 1921, the carriers' contention that current maintenance was deferred may have basis, but they have not supported their contention with such facts of record as would warrant us in making a definite finding of to the extent to which it was deferred. Carriers could not and did not escape the compelling influences which affected other forms of industry during that lean year. The number of their employees was reduced by a fifth, sometimes more; outgo was pared and upkeep skimmed where possible; the "bad-order" figures cover an increasing number of cars requiring heavy repairs, as well as the obsolete and obsolescent, which were not being replaced to the requisite extent; and, in brief, we are left with the abiding, if composite, impression that, on the whole, the railway plant of the country was not at the end of 1921, and is not now, in as good condition as it should be, and is far from ready to meet the demands which will come with resumption of general business activity. There are, of course, some notable exceptions.

We are of opinion that if the return of 3.31 per cent for Class I roads for the year 1921 were corrected, such corrected return would not vary so materially from 3.31 per cent as to make unsafe or unreliable the adoption of that figure as approximating the result of actual operation in 1921.

Constructive Year

Rapidly changing conditions since August, 1920, make the actual results of operation and the percentage earned of little value as a guide for the future, unless viewed in the light of present and prospective conditions. The carriers in response to our request introduced statements indicating what the results of the operations of Class I roads would be for a constructive year, based upon the traffic of 1921, under rates and costs prevailing in February, 1922. The statements reflect net railway operating income here of \$443,609,800, or a yield of 5.06 per cent on a valuation of \$8,775,000,000 for the eastern group; \$95,350,869, or a yield of 4.25 per cent on a valuation of \$2,243,499,045 for the southern group; \$368,732,961, or a yield of 4.49 per cent on a valuation of \$8,206,000,000 for the western district; and \$907,693,630, or a yield of 4.72 per cent upon a total of \$19,224,499,045 for Class I carriers in the United States as a whole. The valuation used is that taken by us in Increased Rates, 1920, supra, for all railroads, as ad-

justed by them in their estimates to cover Class I roads, with additions and betterments of \$330,000,000 to September 30, 1921, a total of \$778,449,045.

Passing from the constructive year to the prospects for the immediate future, the carriers estimate that the revenue tonnage for 1922 will not exceed that of 1921. In support of this position they assert that in the Middle West the winter wheat crop of 1922 will be less than that of 1921; that there is prospect of a considerable decline in the California citrus crop due to damage by frost; and that in the South the acreage of cotton has been reduced by various factors. We are not ready to accept February crop estimates as accurate, but, even if their forecasts of these three crops are realized, this is far from conclusive that the aggregate tonnage of agricultural products will be decreased. Yields of various crops vary from year to year. Some are good and others are poor, and large yields of other crops may more than offset and deficiency in these three. Moreover, facts of record indicate that in the South cotton growing is being supplanted to some extent by diversified farming.

The carriers asserted that there was no evidence of a revival of business sufficient to warrant a prediction of increased traffic in the near future. Since the second week in January the number of cars of revenue freight loaded had been steadily increasing, but this the carriers in part discounted on the ground that the increased car loadings were caused largely by emergency shipments of coal designed to guard against the contingency of a strike in the coal fields on April 1. The strike has occurred and still continues; and the revenue freight loaded has somewhat decreased.

Taking the charted trend as normal, freight traffic for 1921 was subnormal. We feel justified in accepting increased revenue car loadings as foreshadowing an increased volume of freight traffic. The effect of the coal strike, which began April 1, cannot be forecast. It may affect traffic other than coal and coke. The increase in loading for all freight traffic during the first three months of 1922 was 11.9 per cent over that of 1921.

The increase was general, and not confined to coal and coke. It appears reasonably certain that, with increased traffic and lowered operating expenses, the net railway operating income of the carriers in 1922 would be more favorable, under present rates, than in 1921.

Freight Rates and Charges

The average revenue per ton-mile in 1921 was greater than that for the fiscal year ended June 30, 1914, by the following percentages: Eastern district, 96.1; southern district, 61.4; western district, 59.3; and United States as a whole, 76.2. In 1914 the average-distance haul per revenue ton per road was 155 miles and in 1921, 187 miles.

General reductions ranging from 10 to 22 per cent ordered by us with respect to carload rates on grain, grain products, and hay in the western and mountain-Pacific groups became effective during January, 1922, and upon our recommendation rates on live stock in the same groups in excess of 50 cents per 100 pounds had been reduced 20 per cent, but not below 50 cents, in October, 1921. Practically all other carload rates upon products of the farm, garden, orchard, and ranch throughout the country were reduced 10 per cent in January, 1922. All of these reduced rates, other than those on grain, grain products, and hay in the western and mountain-Pacific groups, expire by tariff limitation on June 30, 1922. Only in these three instances have reductions been made covering the entire country, or the whole of any one or more rate groups, since the increases of 1920 became effective.

Many rate readjustments, resulting in reductions, have been made since the increases of 1920. Some affected a substantial volume of traffic such as export grain, bituminous coal to Lake Erie ports for the Northwest, sand and gravel in eastern territory, ore, lumber, and petroleum and its products. In some instances the volume of traffic after the reduction was less and in others more than before the reductions. Protests, usually alleging undue prejudice, have been filed by shippers against many of these readjustments, and in some cases have resulted in suspension proceedings. Some readjustments have been made hastily under pressure from particular shippers, or for the purpose of retaining traffic or deflecting it from one group of carriers to another.

In their constructive year, which is based on 1921 tonnage, the carriers estimated the net effect of the reductions in the revenue of Class I roads at \$186,700,000, distributed as follows: Eastern group, \$75,000,000; southern group, \$15,200,000; western district, \$96,500,000. These estimates represent but 4.7 per cent of \$3,963,900,000, the freight revenue for 1921, as adjusted by carriers to cover rate reductions made prior to January 1, 1922. The total amount paid by shippers and passengers for transportation has also been reduced by the amount of the transportation taxes, repealed January 1, 1922, which in 1921 aggregated approximately \$186,000,000.

The positions of shippers and representatives of the public in this proceeding are diverse. Many urge immediate radical reductions, contending that rates in the aggregate or on particular com-

modities are unreasonable; that the increases of 1920 contributed to the depression which followed by a few months the date of their establishment; that notwithstanding some readjustments and reductions subsequently made, the existing rate level is preventing a revival of commerce, and, by diminishing the flow of traffic, defeats the desired end of producing adequate net return for the carriers. Others urge that rates be reduced as soon as possible, but express no opinion as to whether reductions should now be made. Most of the general commercial and shippers' organizations urge that reductions when made should apply generally to all rates, as did the increases of 1918 and 1920, but no shipper or shippers' organization urged reductions in fares as well as in rates. Numerous state commissions in the West and South contend that reductions should be made both in rates and in fares. The representatives of certain industries and of a few general organizations urge that reductions be applied only to basic commodities, the staples which are recognized as most important to the economic situation of the country, and which usually constitute low-grade freight.

The carriers are unanimous in the opinion that increased rates have not caused the business depression, which they attribute to generally recognized world-wide readjustments resulting in unfavorable trade and credit conditions, restricted purchasing power, contraction of consumption, and, in many instances, collapse of demand. The carriers contend that the increased rates were not even an important contributing factor in the lessening of traffic in 1921, and that reduction in rates will not restore normal traffic. They admit that rates are too high and must come down, but they insist that rates can not be further reduced until the costs of transportation are further reduced.

Rates generally have been increased twice in the past four years, the increase of 1920 alone having been intended to produce more than one billion dollars additional revenue from the transportation of freight. As wages and cost of materials have been materially reduced since the increases of 1920, it is the position of shippers generally that the inability of the carriers to earn a fair return since these reductions were made is due largely to the failure of traffic to move in normal volume, and that the most important problem before us is to devise rates that will move more traffic and at the same time be compensatory to the carriers. It is generally recognized that existing high rates are a burden upon commerce, and many shippers insist that they are forcing movement to other forms of transportation, tend to restrict traffic, and in some instances to prevent particular movements. Many complaints are also made relative to the disturbance of relationships between producing or consuming districts due to the manner in which rates have been increased, and to partial readjustments which have subsequently taken place. The belief is general that traffic has been localized and the radius of distribution reduced.

Numerous shippers sought reductions in rates on commodities manufactured or handled by them. Most of these shippers contended that their commodities are basic and accordingly entitled to first consideration; or that, if any reductions are to be made, such reductions should apply upon their commodities quite as much as upon commodities generally characterized as basic. Some shippers stressed the relatively high level of class rates, and pointed to increases therein as well as in classification ratings of many articles, in addition to general increases. They stated that the net result of the various changes has been to widen unduly the differences between carload and less-than-carload rates, and urged that to widen further these differences by reducing carload commodity rates and not class rates would have a serious effect. Some of the miscellaneous commodities move generally on class rates, others on commodity rates. Commodities which move on class rates in some territories move on commodity rates in others. The wide range of evidence presented; the numerous and diverse interests concerned, and the competitive relationship of many commodities, accentuate the difficulty of selecting individual commodities for specific reductions.

Passenger Fares

According to statistics compiled by us from annual reports of Class I roads the operating ratio in 1920 for passenger and allied services was more favorable than that for freight service. For the 12 months ended September 30, 1921, the situation was reversed, and, except in the southern district, the operating ratio for the freight service became the more favorable of the two. This is readily explained by the greater increase in freight rates than in passenger fares and by the fact that decline in traffic permits of greater reduction in freight-train than in passenger-train mileage.

Many causes contributed to the decrease in revenue passenger-miles in 1921. They include the business depression, the increased use of motor vehicles, the improvement of highways, and the high level of passenger fares. Reduction in fares would no doubt increase travel somewhat, but the record does not warrant the conclusion that under existing conditions this stimulus would suffice to offset the resulting loss in revenue. Eastern carriers

estimated that restoration of the passenger fares of August 25, 1920, a reduction of 16 2/3 per cent, would result in a revenue loss of \$176,560,000 annually in the whole country, and that to offset that loss an increase of 20 per cent in passenger traffic would be necessary, allowing nothing for the added expense incident to the additional traffic.

The Pullman Company sought removal of the surcharge, contending that it tended to reduce travel in sleeping and parlor cars. A sharp decline in such travel followed the application of the surcharge. Fluctuations since September, 1920, in the number of Pullman passengers carried have almost paralleled those in the number of all revenue passengers carried.

The record indicates that travel in sleeping and parlor cars has not decreased in substantially greater ratio than travel generally, and does not warrant a conclusion that the decrease in travel in sleeping and parlor cars is traceable to the surcharge.

Conclusions

The carriers take the position that we must be guided solely by those things which are definite and certain in the past. With this we can not agree. Our function under the law is not that of mere computers and can not thus be atrophied. The duty to prescribe rates for the future carries with it the obligation to exercise an informed judgment upon all pertinent facts, present and past, in order to forecast the future as best we may.

When we decided Increased Rates, 1920, *supra*, the country was still in a period of steadily rising prices. We then resolved doubts as to future operating costs in favor of the carriers. In recent months costs have been declining and traffic increasing. Rates of pay for employees have been reduced to an extent which, based upon the light traffic of 1921, is estimated by carriers to aggregate more than \$350,000,000 per annum. The Railroad Labor Board has estimated that the reduction exceeds \$400,000,000 per annum, without taking into account changes in rules and working conditions. The tendency is toward increased revenues, lowered costs, and higher net income for the carriers.

Under the adverse conditions of 1921 the net railway operating income of Class I carriers of the United States totaled \$614,810,531. Based upon the subnormal traffic of that year, and the wage rates, and prices of materials and supplies, prevailing at the end of the year, the carriers in their constructive year estimated an aggregate net railway operating income of \$907,693,630, equal to 4.72 per cent upon the valuation used by us as adjusted by carriers to cover Class I roads only, including additions and betterments since January 1, 1920, amounting to \$778,499,045. Adopting the ratio of net railway operating income of all carriers to that of Class I carriers in 1915 and 1916 as being approximately correct for 1921, the net railway operating income in the carriers' constructive year would be for all carriers \$923,783,340, or 4.89 per cent upon the valuation.

We do not accept the adjustments made by carriers in their constructive year as correct or complete. We have indicated that further adjustments are necessary in order better to reflect probable expenditures for federal income tax, fuel, and materials and supplies. Reductions in rates will carry with them reductions in operating expenses of carriers through lessened transportation charges paid by them on their fuel and materials and supplies. Thus it is estimated that a reduction of 10 per cent in transportation charges on coal would effect a saving of over \$7,000,000 on the amount of coal consumed by Class I carriers in 1921.

The net railway operating income of all carriers has exceeded \$900,000,000 in only two years, 1916 and 1917. In 1916, the most prosperous year in the history of the railroads, it aggregated \$1,051,543,860, and during the three years of the test period the average for Class I carriers was \$906,524,492, approximately the amount which accrued as annual rental to the carriers under federal control.

The figures heretofore given include no estimate for increased traffic over that of 1921, which clearly was subnormal. We do not anticipate return to the tonnage of 1920 for some time to come, but there are many indications of greater tonnage than in 1921. The car loadings for February and March, 1922, exceeded those of the corresponding months in 1921 by 11.7 per cent and 19.9 per cent, respectively. During the first three months of 1922 car loadings exceeded those of the same period of 1921 by 11.9 per cent.

Any additional tonnage realized should be handled under a favorable operating ratio. It appears that under present rates, and with an increase of 10 per cent or more in traffic over that of 1921, not only would the net railway operating income of the carriers as a whole for the next 12 months be substantially in excess of the fair return herein determined, but it would greatly exceed the corresponding figure for any year in the history of railroad operation.

In 1920 we authorized large increases in rates and fares designed to produce the necessary revenues under the conditions then prevailing. There was then little doubt of the ability of industry to

bear the increased charges. The situation has since changed. High rates do not necessarily mean high revenues, for, if the public can not or will not ship in normal volume, less revenue may result than from lower rates.

Shippers almost unanimously contend, and many representatives of the carriers agree, that "freight rates are too high and must come down." This indicates that transportation charges have mounted to a point where they are impeding the free flow of commerce and thus tending to defeat the purpose for which they were established, that of producing revenues which would enable the carriers "to provide the people of the United States with adequate transportation." In 1921, freight traffic was only slightly more than 10 per cent in excess of that in the year ended June 30, 1915, which was not an unusual year. But the charges for moving freight traffic in 1921 totaled nearly four billion dollars, or about two billion dollars in excess of 1915. Railway operating revenues in 1921 aggregated about 5 1/2 billion dollars, or more than 2 1/2 billion dollars in excess of 1915. If the traffic in 1921 had equaled that indicated as normal by the trend during the 26-year period preceding the war, freight revenues and total railway operating revenues would have exceeded those of 1915 by approximately 2 1/2 billion and 3 1/2 billion dollars, respectively. Without any allowance for pyramiding of transportation charges in goods passing from hand to hand, these figures are significant as explaining, at least in part, existing wide spreads between the amounts received by producers and those paid by consumers.

Manifestly the depression of 1921 resulted primarily from causes other than transportation charges. But it does not follow that under present conditions existing high rates do not tend to retard the return to a more normal flow of commerce. Deflation has taken place to a greater or less extent in wages and origin prices of commodities in nearly all branches of industry but most transportation charges are still near the peak.

Practically all agree that stability of freight rates is highly desirable and that normal traffic may not well be expected until the present widespread expectation of rate reductions is realized or dispelled. To assume that rates can or should be stabilized on the present high basis is futile. As already observed, the anticipation of a falling market tends to restrict purchases, and until the public is convinced that there is little likelihood of immediate further material reductions in prices or transportation charges, the confidence necessary to normal business will to that extent be impaired. The period of deflation has been in progress more than 15 months; demand is reviving; prices are showing a tendency to stabilize upon a level much below that of 1920 but above that of pre-war years; and conditions of the agricultural and manufacturing industries have greatly improved in the past few months.

We are of opinion that general reduction in the rate level, as substantial as the condition of the carriers will permit, will tend not only to lessen the transportation burden but also to equalize and stabilize the conditions under which commerce and industry are carried on, with consequent fuller assurance to the carriers of realizing the fair return contemplated by the law.

The raising of the rate level by the director general of railroads in June, 1918, and again under our authority in August, 1920, were necessitated by increases in operating expenses. The latter have now partially receded. The rate increases were general and justified by the increase in general cost of service, and with decrease in that cost a rate decrease, also general, is justified. The justification for decrease is to be found in the rate structure as a whole rather in individual rates, or in rates on individual commodities. It is true that the prices of some commodities have receded more rapidly and to a greater extent than others, even as some went up more rapidly and to a greater extent than others. The needs of commerce can not be met if rates are to fluctuate with market prices of commodities. In bringing down the rate level to meet lowered expenses a similar process should be followed and the reduction made generally upon all commodities in substantially equal ratio.

Under the circumstances described in paragraphs (a), (b), and (c), below, carriers should consider existing freight rates and charges as representing those made effective by authority of Increased Rates, 1920, *supra*, and shall apply the reductions herein prescribed accordingly, even though in such instances some individual rates or charges may be higher and others lower than those which would result from exact application of the bases above prescribed:

(a) Where, since August 26, 1920, rates or charges have been readjusted primarily to remove discriminations, prejudices or discrepancies without material effect upon the aggregate level of the rates or charges so adjusted. This does not apply to rates or charges which have been reduced since August 26, 1920, primarily for the purpose of removing all or a part of the general increase of 1920.

(b) Where previously existing recognized rate relationships were maintained in applying the increases of August, 1920, or where rates have been readjusted since August 26, 1920, to restore previously existing recognized rate relationships. In these cases,

such recognized rate relationships should be maintained in applying the reductions herein prescribed; or, if that is impracticable in the first instance, the rates should be readjusted to restore such relationships as soon as practicable.

(c) Where, pursuant to decisions by us, rates or charges shall have been changed since August 26, 1920. This does not apply to rates resulting from Rates on Grain, Grain Products, and Hay, 64 I. C. C., 85; National Live Stock Shippers' League v. A. T. & S. F. Ry. Co., 63 I. C. C., 107; Southern Hardwood Traffic Asso. v. I. C. R. R. Co., 66 I. C. C., 68.

Where outstanding decisions require changes in rates or charges subsequent to June 30, 1922, the rates or charges existing on June 30, 1922, shall be reduced as herein provided, effective July 1, 1922. In proceeding thereafter to comply with such outstanding decisions, the rates or charges which would result therefrom shall be considered as those effective by authority of Increased Rates, 1920, supra, and the reductions herein prescribed shall be applied thereto, except that this provision shall not apply to rates on brick and related articles as prescribed for application between points in the eastern group in National Paving Brick Mfrs. Asso. v. A. & V. Ry. Co., 68 I. C. C., 213. Those rates are not required to be further reduced hereunder.

Where rates on live stock have been reduced pursuant to our recommendations in National Live Stock Shippers' League v. A. T. & S. F. Ry. Co., supra, and are now less than the rates herein prescribed, the expiration date thereon should be canceled and the rates maintained in effect.

Separate Opinions

Chairman McChord assented to the report in so far as it results in a reduction of rates, but stated that he was not in full accord with it. He was opposed to fixing the rate of return at this time and thinks if a rate is to be fixed at all it should not exceed $5\frac{1}{2}$ per cent. He also expressed the opinion that the times and conditions plainly demand reductions in rates on all materials and products that are basic to a level that business interests will recognize as the lowest available for some time to come, saying that nothing less will quiet the prevalent unrest and agitation for lower transportation costs and encourage the needed healthy flow of traffic. In his judgment, the general reductions decreed fall short of full attainment of the desired end, and the mutual interests of both industry and transportation demand a 50-50 readjustment of the further material rate increases made under Ex Parte 74. If reductions are to be made on all classes and commodities and a still greater reduction if confined to selected commodities. Reductions on that general basis should also be applied to passenger fares, he said.

Commissioner Eastman, in a concurring opinion, repeated his objection made at the time of Ex Parte 74 that any valid determination of aggregate value is impracticable and it was his judgment that it would have been wiser and better if the commission had announced several weeks ago that its decision would be deferred until after the Labor Board had acted so that it might be assured that the rates prescribed would be the lowest possible under the law and the most likely to remain stable for some considerable period of time.

Commissioner Potter concurred in the conclusion that reductions should be made, saying that if later the commission is convinced that its estimate is not warranted, existing rates can be restored to the extent which then seems necessary. He continued in part:

Notwithstanding the need, which is decreasing, for lower rates, I am not certain that we render a real service to the shipping public in requiring reductions unless and until there is further reduction of operating expenses. Efficient transportation is more important than cheap transportation. Better service was the demand in the busy and prosperous summer of 1920. The increases then authorized were accepted generally without complaint. Returning prosperity will bring its demand for better service and unfortunately the need will be acute. I apprehend that in the near future shippers will lose and suffer more from inadequate service than could result from the continuance of present rates. But responsibility for ultimate results is not upon us. The transportation act in section 15a limits the return we may allow the carriers. We must accord to shippers the supposed benefit of that limitation.

While the conclusions of the report have the support of the majority of the commission, as most nearly representing the

consensus of opinion, it is apparent from the individual expressions that to a considerable extent the views of the majority differ. I call attention to certain respects to which I have preference for different conclusions. Assuming that there is a prospective excess earning available for rate reduction, I think different treatment was required for the following reasons:

1. The percentage increases authorized by Ex parte 74 resulted in disproportionate increases upon long-haul traffic. Therefore, when called upon to eliminate a portion of the increases authorized by Ex parte 74 we should first correct the injustice of that decision by giving preference in reduction to carload and long-haul traffic.

2. The theory upon which reductions have been made since Ex parte 74 on certain traffic, instead of on all, was that such reductions were required in justice to the traffic to which they applied, and in order to bring such traffic into proper relation with traffic as a whole. No unlawful preferential treatment was intended when such reductions were made. The reductions now required do not increase the reduction heretofore made upon agricultural products, live stock, and certain other commodities. As the reductions heretofore made were to remove injustice and establish a proper level and relation as between commodities, it seems to me that in distributing the prospective surplus now available for reduction, such commodities should share.

3. I favor a reduction in passenger fares other than commutation fares and without removing the Pullman surcharge.

4. There are not many, familiar with the conditions in the financial world, who would question the propriety of naming 6 per cent as a fair return upon the property values of the carriers which are devoted to the public service. We should have fixed the return at 6 per cent. We should not be influenced in naming a fair return by our views upon the subject of taxation. Our function is to name a fair return without regard to how much of it the government may decide to take from time to time in taxes.

During the early stages of our deliberations, I was impressed with the notion that in making reductions we should give preferential consideration to a selected list of so-called basic commodities. Further consideration developed objections to this course which to my mind are convincing. It appears impossible at this time to select a list of so-called basic commodities to which reduction could consistently and lawfully be limited. Concluding that there is a prospective surplus available for rate reductions, I know of no theory on which that surplus, resulting largely from hauling certain traffic, can be made the basis for a finding with respect to the reasonableness of rates on other traffic. If we were to select a list, our difficulties would not be reduced. Some situations are more acute than others. Different commodities and different conditions require different treatment. Some rates are not high enough; others are too high in varying degrees. We would not do justice in requiring horizontal reductions limited to particular commodities. If I were persuaded of the practicability of limiting reductions to the so-called basic commodities, I would favor an announcement of the amount available for rate reduction and have a further hearing upon the question as to how specific application should be made. The record is not sufficient to show what selections should be made.

Commissioner Lewis in a dissenting opinion, said that the decision that rates be reduced is unanimous, but his dissent was limited to what appears to him to be "unjustified economic waste." "The margin available for reductions or adjustments that may be required by us is not sufficient," he said, "if spread over the entire freight traffic, to give to the country the relief and to business and industry the stimulation that is urgently needed. A 10 per cent reduction will, in the case of many commodities, have no perceptible influence in lowering costs of living, stimulating industry, ameliorating economic conditions, or bringing us into more favorable and equitable relationships at home and abroad. On the other hand, there are commodities and raw materials that are basic to existence, to industry and to readjustment, on which transportation charges are relatively and absolutely too high. Making these more cheaply available to consumers and manufacturers would contribute to reduction of costs of living, relief in the housing situation, maintenance of productivity of the soil, increased employment and stimulation of buying."

Commissioner Cox, dissenting, concurred to the extent that a measure of relief has been granted to the public generally, but expressed the opinion that the amount available for reduction should have been applied to agricultural products, raw materials and basic commodities.

President Urges Voluntary Rate Reduction

Asked to Cut Charges on Basic Commodities and Given Opportunity to Forestall I. C. C.

By Harold F. Lane

WASHINGTON, D. C.

WITHOUT ANY decision having been announced by the commission as the result of its general investigation ordered on November 23, on which hearings were begun on December 14 and concluded on March 13, as to whether and to what extent, if any, further general reductions in rates can lawfully be required, 19 leading railway executives at a dinner at the White House on Saturday evening were urged by President Harding and Secretary Hoover voluntarily to reduce rates "more particularly on such basic commodities as may be found necessary to speed industrial development."

After explaining the difficulties of railway management under present conditions, the railway executives expressed a desire to do everything consistently possible toward restoring and maintaining prosperity and voted to have a committee named to take up the problem and recommend what action could be taken.

Railway Executives Confer With Commission

Later Daniel Willard, Fairfax Harrison, Hale Holden, H. E. Byram, Charles Donnelly, W. H. Finley and Edward Chambers were appointed as the committee and on Monday morning they met the Interstate Commerce Commission by appointment for a conference. The discussion of the railroad situation continued for about two hours, after which it was announced that it had been adjourned to meet again on Thursday for the purpose of giving the subject further consideration.

The railroad executives emerged from the White House about 12:30 a. m. Sunday, after which the newspaper men were called in to see the President and given a statement that he had invited the railroad presidents and board chairmen to dine with him "and to confer concerning further relief in railway service along particular lines somewhat similar to the voluntary reductions made in some commodities some months ago, more particularly relief on such basic commodities as may be found necessary to speed industrial betterment."

Statement From the White House

"Naturally the whole railway problem was discussed," the statement continued, "and the difficulties of railway management under existing conditions were presented. The railway presidents voiced their unanimous desire to make the fullest possible contributions to restore and maintain prosperity. Of course, the various aspects of the transportation problem were discussed, particularly the necessary preparations in providing new or repaired equipment to amply serve the country when normal commerce is restored."

"The President made it clear he was attempting none of the duties of rate-making nor recommendations, but that he felt that much could be accomplished in a conference and that helpful results must attend a full co-operation of the railway heads with the government body charged with the duty of regulating rates."

"After two hours of discussion the presidents voted to have a committee named from their membership to take up the problem and recommend what action could be taken."

The railroad men who attended the dinner were: A. H. Smith, president, New York Central; Carl R. Gray, president, Union Pacific; W. H. Finley, president, Chicago &

North Western; W. B. Storey, president, Atchison, Topeka & Santa Fe; Edward Chambers, vice-president, Atchison, Topeka & Santa Fe; C. H. Markham, president, Illinois Central; R. S. Lovett, chairman of board, Union Pacific; H. E. Byram, president, Chicago, Milwaukee & St. Paul; Samuel Rea, president, Pennsylvania; Hale Holden, president, Chicago, Burlington & Quincy; Howard Elliott, chairman of board, Northern Pacific; Charles Donnelly, president, Northern Pacific; Ralph Budd, president, Great Northern; Julius Kruttschnitt, chairman of board, Southern Pacific; F. D. Underwood, president, Erie; S. M. Felton, president, Chicago Great Western; Daniel Willard, president, Baltimore & Ohio; E. E. Loomis, president, Lehigh Valley; Fairfax Harrison, president, Southern.

Most of the executives remained in Washington and held a long conference on Sunday at which the committee was appointed, but made no announcement and declined to amplify the President's statement.

Commissioners Visit White House

It has been apparent that the President has been keeping in close touch with the progress being made by the commission, as several of its members have been at the White House both before and since his announcement that he had invited the railroad executives to dinner. Chairman McChord has called on the President several times recently, and was at the White House for a short time on Saturday before the dinner.

It has been understood for a number of weeks that the commission had decided that railroad earnings or the prospects for the year were such as to warrant reductions in rates and it has been stated several times that it had "practically" reached a decision, but it is now stated that the important point of difference among the commissioners has been as to whether the reduction should be general or should be confined to a few specific commodities.

It was stated at the White House that the President had been anxious to secure further relief in rates on basic commodities, but that it was his understanding that this could not be done quickly except by the voluntary action of the railroads because the Interstate Commerce Commission could not, as a result of its general hearing, order reductions on a few specific commodities but must go through a long process of separate hearings on the specific commodities. This point had been raised by various witnesses during the rate hearings who had contended that any reduction should be a horizontal percentage, on the ground that only a few hours of the hearing had been devoted to some commodities, whereas many days would be required to deal with them in a specific complaint case. The commission, it was stated, could not, even after determining that rate reductions are warranted, order cuts in specific commodities at a single sweep.

President Appreciates Difficulties

The President realizes, however, that the desire for reductions on basic commodities presents a very difficult situation to meet and that it is difficult to harmonize the railroads on such a question because some commodities affect some roads more than others. For example, certain roads are almost exclusively coal roads and the effect of a large reduction in coal rates would be concentrated upon them, while roads

depending on a greater variety of traffic would still be on a higher level of rates.

The President has let it be known that he considers that the railroad men at the dinner showed a fine spirit and a disposition to co-operate to the best of their ability but he also appreciates some of their troubles, which they presented to him with great earnestness, and he is less enthusiastic about the result of the railroad dinner than he was about the dinner at which he urged the establishment of the eight-hour day in the steel industry. He was represented as doubtful as to whether the railroads are able to work out the problem in the way the administration desires. If nothing can be accomplished by the railroads, it was said, the entire question would be up to the Interstate Commerce Commission.

The commission was said to have reached a conclusion that earnings are now such as to warrant some reduction in rates but to have divided on the question as to whether it could legally order anything but a general reduction on the present record, or as to what specific commodities should be selected for relief. Those advocating reductions apparently have been considerably influenced by the showing made in March when many eastern roads earned a larger net than they have for some years and the eastern roads as a whole showed a return of 7 per cent, but the President has been told also that a different situation was presented by many western roads and also that the good showing made in the East in February and March was largely due to a rush of coal purchases for storage in anticipation of the strike and that the results since March are much less favorable.

Wage Reductions Declared Essential

The President draws a distinction between what he has been trying to do and any idea of interference with the decision of the rate case. He takes the position that he has been merely discussing general policies for the public good with the railway executives and that, while the rate case is entirely within the province of the Interstate Commerce Commission, if the railway managers step in voluntarily to do what is desired the commission should welcome their co-operation. He has not urged reductions in class rates nor rates on the higher grade commodities. When the railroad executives went to the dinner not many of them knew just what was to be put up to them. They had had a conference among themselves beforehand and had prepared themselves to discuss the general situation from many angles. Naturally the wage question was taken up and the railroad men argued that a wage reduction was essential to a freight rate reduction on the ground that the horizontal increases in rates made in 1917, 1918 and 1920 were made directly to meet wage increases.

President Desires New Legislation

While the question of new legislation was not discussed at the dinner the President has frankly let it be known that he believes that certain changes in the Transportation Act are vitally necessary, but that they cannot be taken up until after Congress begins a new session in December. He is convinced for one thing, as he has said before, that the Labor Board should be brought from Chicago to Washington so that a closer point of contact may be established between the body that deals with wages and the one that deals with rates. Nothing has been given out as to any intention on the part of the administration to try to expedite the decision of the Labor Board in the wage case but it was announced that the President has no present intention of conferring with the railroad labor leaders.

The latest move of the administration follows nearly a year of efforts to persuade the railroads to reduce rates in spite of the fact that they have never in any month since the law was passed earned as much as 6 per cent. Last August the Interstate Commerce Commission issued a report

recommending reductions in western livestock rates, which the railroads made, and then entered upon a hearing involving western rates on grain and grain products. While this proceeding was pending the railroads were urged by members of the commission and other representatives of the government to reduce rates both as a means of reviving business and to improve their relations with the public.

Progress of the Rate Case

On October 7 and 8 the executive committee of the Association of Railway Executives came to Washington and conferred with the President, Chairman McChord of the commission, Secretary Hoover, Chairman Cummins of the Senate committee, Chairman Winslow of the House committee and Chairman Anderson of the Joint Commission on Agricultural Inquiry, all of whom urged the railroads to reduce rates even at a sacrifice. On October 14 a general meeting of the member roads of the Association of Railway Executives was held at Chicago at which the executive committee recommended a 10 per cent reduction in rates on agricultural products but this plan was not adopted by the meeting and it was decided to ask a further reduction in wages with the understanding that the benefit of the reduction should, with the concurrence of the Interstate Commerce Commission, be passed on to the public in the reduction of rates, except insofar as such reductions should have been made in the meantime.

On October 22 the commission made public a report in the grain case, which did not specifically order reductions in grain rates, but declared the existing rates unreasonable and said it would expect prescribed reductions to be made by November 20 and that an order would be issued if necessary. The railroad executives then went to Washington and had a conference with the Interstate Commerce Commission, after which at a meeting in New York on November 16 they decided on a 10 per cent reduction on agricultural products and a petition to the Interstate Commerce Commission to withdraw its grain order and conduct a general inquiry as to whether further reduction in rates could or should be required until a substantial reduction could be secured in the labor and other costs of operation.

The commission on November 21 issued a formal order in the grain case effective on December 27 and on November 23, the date that the railway petition was filed, issued its order for the general inquiry. It then permitted the 10 per cent reduction to be made but later declined to withdraw its order in the grain case. Meanwhile the railroads had made thousands of reductions in rates voluntarily at the request of shippers and in co-operation with the Interstate Commerce Commission, to meet individual situations, some of them of considerable extent, and they took the position at the hearing that further reductions should only be made in the same way until wages could be further reduced than they have been up to the present.

President Sees Business Revival

Even before the railway dinner the President had called attention in a speech before the Chamber of Commerce of the United States and in other ways to the reports received at the White House indicating the general improvement of the business situation. The administration has not taken the position with the railroads that a rate reduction would show immediate or big results in the way of stimulation of business. It has rather taken the position that rates are out of line with the prices of many commodities and that railroad earnings on the more important roads have reached or should soon reach a level where they can afford to do something to help the revival of business. The effect on the situation of the expected decision of the Railroad Labor Board has also been discussed but to what purpose has not been made public.

Some Notes on Railway Refrigerator Cars*

Survey of Existing Equipment; Efficiency of Insulation; Special Systems of Refrigeration

By W. H. Winterrowd
Chief Mechanical Engineer, Canadian Pacific

IN AN ENDEAVOR to sense the trend of refrigerator-car design, proportions, and construction, the writer addressed an inquiry to a number of railways and private-car owners. A comparison of the most interesting returns makes a very interesting study, although the fact must not be overlooked that possibly some of the railroads or owners, if building equipment today, might modify their designs.

Every road or owner represented owns at least one thousand cars. As far as possible the cars were chosen from quantities built in comparatively recent years. Many of the old timers, really not refrigerator cars at all, were omitted. Even so, some of the cars built in recent years provoke question.

During the past three years car building or re-building has been at a minimum. Even so, it is of great interest to note that many of the cars built within this period, or being designed or constructed today, embody in great measure those principles which make for an efficient and economical unit.

Types of Cars and Ice Containers

Generally speaking the cars can be divided into two types: one, equipped with brine tanks and generally used for carrying meats; the other, equipped with bunkers, and used principally for carrying commodities such as eggs, butter, vegetables and fruit.

In connection with this distinction, based on ice containers, it is interesting to note that Dr. Pennington has stated that a car of the basket bunker type, such as the U. S. Railway Administration Standard, will carry meat hung from rails quite as successfully as a car built especially for meat. The statement is also made that there is not visible in practical results the advantages supposed to accrue from the retention of the brine, provided coarse rock salt is placed on top of the ice in the bunker and so forced to bore its way through the whole mass before finding an exit.

But there is a very important problem in this connection that must not be overlooked if salt is to be used with ice in a basket bunker, and that is the method of disposing of the brine. It is common knowledge that if brine falls on journal boxes, side frames, arch bars or other truck parts, as well as upon rails, tie plates, bridge members, etc., the resulting damage is great and a factor involving heavy maintenance cost.

The subject is so important that the American Railway Association interchange rules specify that after July 1, 1922, no car carrying products which require for their refrigeration the use of ice and salt and which are equipped with brine tanks, will be accepted in interchange unless provided with a suitable device for retaining the brine between the icing stations.

If salt is to be used with ice in basket bunkers, a practical and economical arrangement is necessary to retain the brine so that it can be disposed of between icing stations.

The data submitted do not show any car of the basket bunker type equipped with overhead meat racks. They show

that cars built for carrying meats and products requiring a low temperature are equipped with brine tanks.

Twenty-seven railroads and owners are represented in the replies. Out of this number the principal cars of 16 are equipped with bunkers, and the remainder are equipped with brine tanks. Out of the 16, 11, or practically 69 per cent, are of the basket type; the remaining 5, or approximately 31 per cent, are of the box type. The majority of the cars recently built, or now under construction are equipped with the basket type of bunker. The demand for refrigeration and the special-service car, as well as greater efficiency of the permanent basket type, appear to be decreasing the demand for the collapsible bunker.

Bulkheads

The majority of the cars tabulated are equipped with solid bulkheads. These are either built into place or are hinged from the walls or ceiling so that they can be swung open. A few cars are equipped with the syphon system, in which the bulkhead consists of a framework holding a series of galvanized iron louvres supposed to direct the air back and down into the bunkers. The theory is that air entering the bunker over the top of the bulkhead becomes chilled, and in its downward motion creates a suction or siphoning effect which draws air from the body of the car into the bunker through the openings in the bulkhead. Although this system is on some cars of fairly recent origin it is significant that many railroads or owners who used it on their older cars have abandoned it in favor of the solid bulkhead.

The prevailing trend of construction indicates a recognition of the value of solid and insulated bulkheads.

In the matter of efficient refrigeration the distance between bulkheads is an important one. The tabulation shows that this varies between 28 ft. 8 in. and 38 ft. 10 in. The general trend is between 32 and 34 ft.

Difficulty in obtaining proper temperatures at the center and top of the lading has been responsible for the thought that longer cars and less deep loading would bring better results. Longer cars have been demanded also as the result of a desire to increase their capacity.

The principle has been emphasized that heat transmission varies directly as the number of square feet of surface enclosing the car space. A study of some of the long cars indicates that this principle has not been followed closely in determining the kind and amount of insulation.

Floor Racks

Space between the top of the floor rack and the floor of the car averages between 4½ and 5 in. The majority of the modern cars are equipped with these racks, but an examination of the tabulation would indicate that their importance is not fully recognized. This fact is borne out by an examination of hundreds of refrigerator cars at a fruit- and produce-distributing station. Many of the cars with long slats or runners fastened to the floor are of such construction and equipped with such types of bulkheads that floor racks could be applied easily and cheaply.

An impression seems to prevail that the life of a railway refrigerator car is about 6 to 8 years. In 1919 a committee

*Conclusion of abstract of a paper presented before the American Society of Mechanical Engineers at New York on May 16. The first part of the paper was abstracted in the issue of May 20, page 1173.

of the Mechanical Section of the American Railway Association reported that the average life of railroad-owned wooden refrigerator cars, dismantled, was 17.1 years, and of private-line wooden refrigerator cars, dismantled, 21.9 years, making the average life for all wooden refrigerator cars, dismantled, 19.4 years. It was also stated that the average life of railroad-owned wooden refrigerator cars was largely affected by two lines reporting the dismantling of a large number of cars of an average life of only 15 years; by excluding these two lots of cars, the average life for railroad-owned wooden refrigerator cars was 21.3 years, and for private-line-owned cars 21.9 years.

The life of refrigerator cars equipped with steel underframes or steel framing and superstructure is a matter upon which there are little data, because such cars are comparatively modern. There seem to be no reasons, however, barring those of possible evolution, why such cars should not have a long life and require little for maintenance by reason of their better design and construction.

It is not difficult to appreciate the causes responsible for the high cost of maintenance of old wooden cars; the refrigerator type does not stand alone in this class. But in addition to more severe traffic conditions, this type of car has required attention on account of the difficulty in keeping moisture away from the insulation as well as from the wooden framing and flooring. If the insulation becomes broken, wet or sags so that air can circulate around it, the car rapidly loses its efficiency.

Floors

The chief problem in floor construction is to make the structure waterproof, as well as a good insulator. Moisture and water finding its way through the floor or along the floor boards into the walls of the car, have been responsible for much trouble and expense.

The insulating value of all materials that absorb moisture is greatly decreased when water is absorbed. In addition, water causes most of the insulating materials popular in refrigerator construction to become mushy and sag or drop out of place. It also causes wood floors, lining and framing to decay and weaken, thereby making it more difficult to keep the general structure tight.

Nearly all the modern or at least recently built floors employ a construction involving cork as an insulating material. To keep moisture away from the cork various waterproofing compounds or waterproof materials are used. Fig. 5 shows a photograph of the floor and manner of applying insulation.

In past years it was the opinion that floor insulation with intervening dead-air spaces gave the highest insulation value in walls and roofs as well as in floors. More recent opinion differs because experience has shown that unless unusual methods of construction or maintenance are used, it is very difficult to keep the air spaces tight. To be insulators, they must be dead-air spaces; once circulation starts their efficiency is destroyed.

Walls

In connection with a waterproof structure, it is interesting to note the various methods employed at the junction of the floor and side walls to keep water from getting past the lining and into the insulation. This point has been a source of great trouble.

An exceedingly interesting example of waterproof construction is contained in some all-steel refrigerator cars designed by W. F. Keisel, mechanical engineer of the Pennsylvania Railroad. The body of the car consists of an all-steel container placed within an outer container, the space between the walls being filled with insulation. At the floor, the sections of the inner container are welded together, thus making the floor practically one piece and water-tight and

thereby affording maximum protection to the insulation.

Inspection of the various cross sections indicates a general trend toward massing wall insulation and eliminating air spaces between the layers of insulation. As a rule the insulation is applied in a continuous strip from door post to door post. The advantage of applying insulation in this way lies in the fact that a continuous or unbroken surface presents no joints or openings through which air can pass or circulate. It has been the experience that where insulation is applied in sections, unusual construction is required to prevent eventual air circulation. Wall insulation is rarely less than 2-in. thick on the most recent cars. In some cases

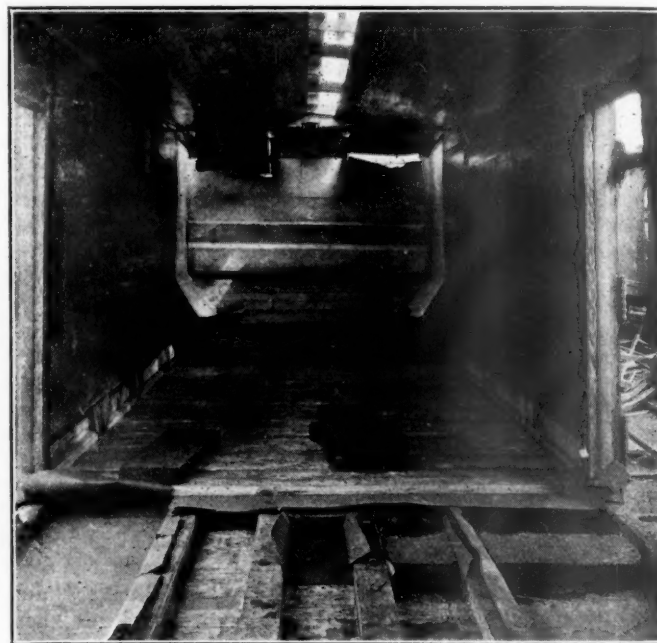


Fig. 5—Method of Applying Insulation and Waterproofing in Floor

this insulation is applied in two massed layers. In one case the single layer is 2-in. thick. In the majority of cases four massed layers of $\frac{1}{2}$ -in. insulation are used.

Roofs

The tendency is to apply massed insulation in the roofs. As a rule the most modern cars have 2 to $2\frac{1}{2}$ in. of insulation applied in this way.

Some cars are equipped with a carefully designated double-board roof with waterproofing compound between the layers. There are many advocates of this type of roof, but it is interesting to note the number of outside-metal roofs that are applied to cars of this type. The advocates of the outside-metal roof claim a saving in weight and greater protection to the sub-roofs and insulation from moisture, claiming that with proper insulation the metal roof has no effect on the interior temperature of the car.

Miscellaneous

Doors and Hatches.—Doors and hatches are being made with more insulation and are being strongly and properly constructed so that they will fit the door openings tightly, and not permit any loss of refrigeration due to leakage. In this connection, any other openings into the car should be so constructed that they can be kept tightly in place and easily maintained. An efficient door-locking device is no small item in keeping doors tight, and thereby maintaining the efficiency of the car.

Painting.—Refrigerator cars should be kept well painted in order to preserve all exterior surfaces. This is in the

interest of obtaining long life for the car. Metal parts should be given particular attention in this respect.

The writer believes that refrigerator cars should be painted with a light or non-heat absorbing color. Dark colors absorb heat. An inquiry addressed to the owners of white and

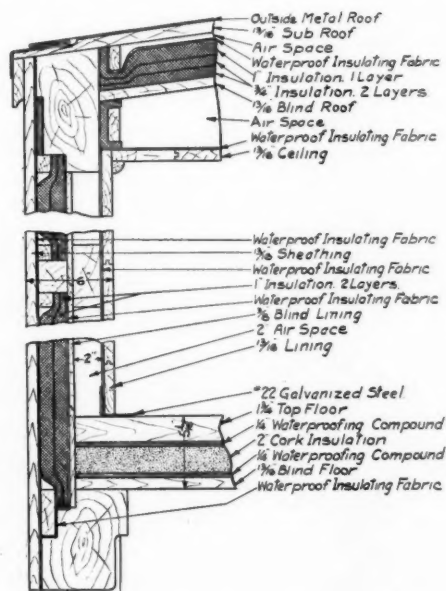


Fig. 6—Type of Construction Giving High Insulating Efficiency

yellow cars indicated that no specific data existed on the subject, but it was the general belief that the light colors were an advantage in this respect.

Insulation

The paper discusses at some length the properties desired in an insulating material and the thermal conductivity of various materials and compound structures. After giving

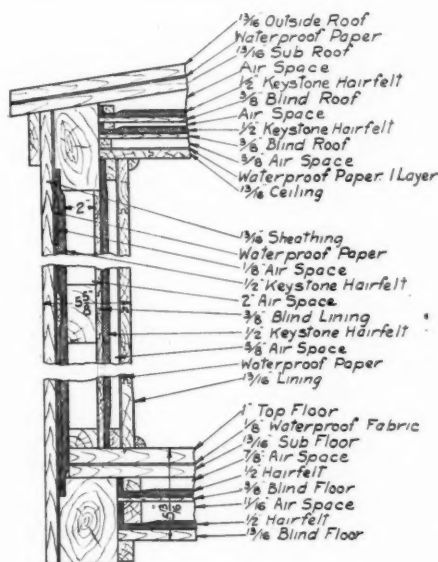


Fig. 7—Heat Transmission Through Cars of This Type Is Much More Rapid Than for the Car Shown in Fig. 6

the formulas for heat transmission the amount of heat transmitted through the walls of two typical refrigerator cars is compared.

The calculations were made in two ways: first, by assigning an insulating value to the air space, and second, by

eliminating it entirely. Comparative results are shown in Table 1. The car cross-sectioned in Fig. 6 is used as an illustration of good construction and relatively high efficiency. The car shown in Fig. 7 is used in comparison in order to show the greater rate of heat transmission or lower efficiency caused by different methods of insulation and construction.

Materials and Workmanship

Proper materials are a very important factor in refrigerator car construction. The right grade of lumber should be used wherever required, and it should be properly dried before being placed in the car. Workmanship should be of the best. Insulation should be handled carefully, care

TABLE 1 Comparison of B.t.u. per sq. ft. per deg. diff. F. per 24 hr. in cars shown in Fig. 6 and Fig. 7				
	Including air space		Excluding air space	
	Fig. 16	Fig. 27	Fig. 16	Fig. 27
Roof	1.702	2.328	1.953	3.12
Wall	2.172	2.80	2.388	3.768
Floor	2.46	2.544	2.46	3.24

being taken to see that it does not become torn or damaged. Such insulation placed in a car makes a weak link in a possibly otherwise strong chain. Some care in initial construction with attention to these details makes for an efficient car, as well as one that will have a longer life and lower maintenance cost than a car not receiving such attention.

While on the subject of materials, it is important to note the growing interest in the use of car lumber which has received preservative treatment. Lumber so treated has received considerable attention from car builders and car owners for several years, and much of it is now in service. Sufficient time has not elapsed to indicate what increased life can be obtained, but experience to date indicates treated lumber to be more durable, and one that will resist moisture and decay.

The Marsh Refrigerator Service Company has used creosote-treated lumber in certain parts of its refrigerator cars, such as sills, sub-floors and roof boards, and appears to be the pioneer in the use of treated lumber in refrigerator cars. The writer has been advised that this lumber is giving excellent service, and that no objection can be made to it on account of any odor caused by treatment. The treated lumber in these cars is submerged for a number of hours in hot creosote oil, after which it is placed in a driprack and permitted to drain. It is estimated that this treatment will result in large saving, doubling the life of the roofing boards and sills, and effecting considerable saving in labor that would otherwise be necessary to properly maintain these parts in the course of time.

An interesting report in connection with the use of treated lumber for use in the construction of cars was presented recently before the American Wood Preservers' Association. This report calls attention to the fact that decay is the principal cause of failures in lumber, and that great economy is possible by the use of a preservative.

It is evident that if some of the wooden parts of a refrigerator car can be made moisture proof or highly resistant to moisture, the efficiency of the car can be maintained at a much higher average.

The writer has been advised that some refrigerator cars are in service in which Balsa wood is the principal insulating material. This wood is very light in weight, having in its natural state a density of 7.1 lb. per cu. ft. It is a South American wood that grows very rapidly, and is of cellular structure. It has a thermal conductivity of 7.5 in its natural state and 8.3 when treated with waterproofing compounds.

It would be of great interest to know if treated or untreated Balsa wood is used between the ordinary walls of a car as insulation, or if the material figures largely in the construc-

tion of the superstructure of the car, such as lining and sheathing. Its strength is insufficient for its use in framing. It would also be of interest to know if the material is durable and efficient in this class of service, if any modification of car structure is necessary for its use, and if any reduction of car weight can be accomplished by its employment.

Some Other Systems of Refrigeration

A previous statement indicated that some reference would be made to other systems of refrigeration. In the cars described, refrigeration is accomplished by means of air circulation, the air being cooled by contact with ice or ice containers placed at the ends of the car.

One modification of this system is a car in which ice containers are placed just below the roof and in the center of the car. In this system it is claimed that maximum refrigeration can be applied where the air within the car is at its highest temperature.

There do not appear to be a great number of cars of this type in modern service. The principal objections to such a system are decreased head room in the center of the car, weight of ice near the roof of the car, and difficulty of adopting this system for use with meat racks placed below the ceiling of the car.

Another system consists of a brine tank built into the roof at each end of the car. These tanks extend about 9 in. below the ceiling and are heavily insulated on top, sides and bottom. The tanks at each end of the car are connected to each other by pipes hung about 2 or 3 in. below the ceiling. The pipes are not insulated. In each tank is a partition

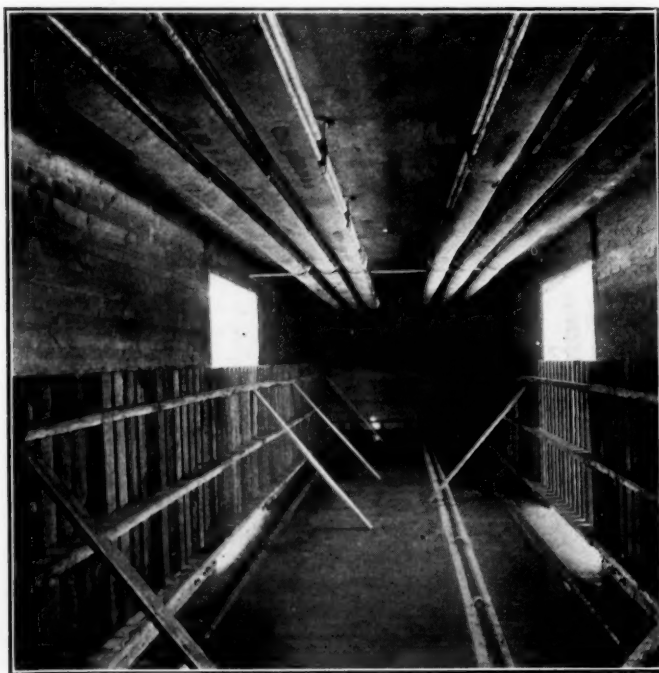


Fig. 8—Car with Overhead Brine Tanks, Showing Also Heater Pipes on Floor

running lengthwise of the car. In one partition are some check valves opening to the right; in the other partition some check valves open to the left. The theory is that when ice and salt are placed in the two tanks the swaying of the car in motion automatically circulates the brine through the pipes, refrigeration being accomplished by contact of the air within the car against the surface of the pipes connecting the two tanks.

Comparatively speaking, this system has not been in service a very great length of time. The advantages claimed

for it are increased loading space, decreased consumption of ice, uniform temperatures, and a car that can easily be changed from a refrigerator to a heater car. The writer understands that these cars are being tested in various fields of service. It would be interesting to have some information regarding the ability of this system to supply refrigeration when the car is not in motion, and what the system can accomplish in the way of quick pre-cooling when the car is placed at the loading shed or platform.

The interior of such a car is shown in Fig. 8. This illustration shows the floor racks propped up against the side walls so that the piping along the floor beneath the racks can be seen. This piping is used when the system is used to heat the contents of the car. Canvas troughs are placed beneath the piping located beneath the ceiling in order to catch any condensation or frost slush that may drop from these pipes.

Pre-Cooling

The importance of pre-cooling the lading and the resulting economy in the use of ice and labor were mentioned in a preceding paragraph. There are two distinct methods of pre-cooling cars and lading. The first is known as shippers' pre-cooling; and the lading is placed in cold storage rooms in which the proper temperature is maintained, and where the lading is allowed to remain until it cools to the proper temperature, after which it is loaded quickly into cars that have been pre-iced. The second method is known as the carriers' pre-cooling, and generally consists of a system in which the car is loaded, after which the interior of the car and the lading are pre-cooled by mechanical means.

Great economies are possible due to pre-cooling. Where small tonnage originates little pre-cooling has been done by mechanical methods on account of the high cost of the plant and equipment. Most mechanical pre-cooling is done where large tonnage originates. At such points the shippers frequently combine to build such a plant. Pre-cooling is receiving more and more attention in connection with various commodities and additional economy in the way of ice and labor may be expected.

General Conclusion

The inquiries upon which these few notes on railway refrigerator cars are based, indicate that a very great improvement has been made in refrigerator car construction and design, particularly within the last few years, but there is also evident indication that the field of investigation in connection with cars of this type is still a most fertile one. Some fairly recent cars indicate that the subject of refrigeration in transit is not appreciated in some quarters as it should be. The subject of efficient refrigeration is a most important one, because cars that can be kept in continuous service with a minimum cost of maintenance and which are sufficiently efficient to protect the lading in transit, mean dollars and cents to the railways.

TWENTY-EIGHT CITIES report that, in the year 1921, the number of fatalities in automobile accidents within their limits was smaller than in 1920; and some of the differences are striking. In Detroit the number was 134 as compared with 240 in the earlier year; St. Louis 97 as compared with 192; Buffalo 27 and 77; Indianapolis 56 and 98; Milwaukee 53 and 79; Newark, N. J., 44 and 70; Akron, Ohio, 13 and 26. These figures are given out by the National Automobile Chamber of Commerce, New York City, which finds that, for the nation as a whole, there was an increase in fatal accidents in 1921, though the total in proportion to the number of motor vehicles in use, was less than in preceding years. For 1921 the number of cars registered was 10,448,632; number per thousand of population 99, and automobile deaths per 100,000 of population 11.

Fuel Association Holds Annual Meeting

Heavy Program Includes the Consideration of Many Operating Problems Affecting Fuel Economy

EVIDENCES OF THE interest in and support of the railway fuel conservation movement on the part of executives and operating officers and an interest in the relation of fuel costs to other operating factors characterized the fourteenth annual convention of the International Railway Fuel Association, which was held at the Auditorium

Hotel, Chicago, on May 22 to 25 inclusive. After the usual opening exercises the meeting, with over 450 members in attendance, was addressed by L. W. Baldwin, vice-president, Illinois Central, followed by the address of W. L. Robinson (B. & O.), president of the association. Mr. Baldwin spoke in part as follows:

L. W. Baldwin's Address

THE CONSERVATION of fuel rests largely with these two principles: 1. Interesting and educating the men who place fuel on the fires, and 2. Developing and using proper machinery. My experience has taught me that each of these constitutes a vast field of opportunity.

Coal means more now than it did prior to the war. The increased cost has made it necessary for us to get our coal burned in such a way as to use a minimum amount and get maximum efficiency. On the railroad of which I am an officer we maintain an organization to educate our men to burn coal scientifically. This organization has a car fitted up for holding fuel conservation classes and is constantly visiting the terminals, large and small alike. The men doing this educational work are peculiarly fitted for their duties. They have studied fuel production and uses from various angles, and they impart their experience to the men, display films, make replies to questions, and exchange views on all phases of fuel conservation in their meetings, in fact so impress officers and men that they actually appreciate it is a crime to waste fuel.

The education of the men and the carrying out of good practices cover a wide scope of endeavor on the part of those in charge of and who are to teach fuel conservation. Great care must be taken to insure the selection of men for such positions who are qualified by experience, are natural enthusiasts and in whom all who should be concerned in fuel economy have confidence.

We have distributed a book entitled "Fuel Economy on Locomotives" which deals with the subject at length, but we can't depend on the book to do the work. To get the best results, it is necessary to employ the personal contact method.

In addition, we have a General Fuel Conservation Committee, consisting of the general superintendent of transportation, the general superintendent of motive power, the engineer maintenance of way, the purchasing agent, the auditor of disbursements, and the superintendent of fuel conservation, and fuel committees on each division consisting of division officers, enginemen, trainmen and others. This General Fuel Conservation Committee has to do with purchase, inspection, storage and handling of coal, including all feasible economies that can be effected. The duty of the division fuel conservation committees is to study in more detail the ideas of the General Fuel Conservation Committee and general officers, circulate the results obtained by individuals as well as to instruct as to best methods to be used.

On the Illinois Central System we conducted a fuel conservation campaign throughout September and October, 1921. Enginemen and trainmen on the same terminals competed with one another, and divisions competed for rank. Daily reports of fuel consumed in freight, passenger and yard service were obtained from all divisions, and reports showing the number of pounds of coal consumed per 1,000 gross ton miles, per 100 passenger car miles and per yard engine mile for all divisions were promulgated daily. The campaign

was an interesting and successful one and produced a saving on our lines of 30,000 tons in one month alone. I attribute the success of the campaign to the initial interest taken by enginemen, trainmen and other employees concerned in fuel consumption, and the spirited competition which resulted from posting individual accomplishments. Of course, the local officers must be duly credited for the intensive interest developed in preparing for and during the campaign.

I do not want to be quoted as saying that fuel conservation results are entirely in the hands of the men and local officers. There are a great many things for the managements of the railroads and other properties to consider and act upon. We must have fuel inspection at the mines, and, where coal is placed in storage, it must be scientifically handled to insure economical and proper results. Our purchasing departments must surround the purchase of coal with recommendations made by men competent to pass upon the grades and preparation of coal. Power plant and station use of coal on some railroads warrant specialized supervision, with a man in charge who is thoroughly trained in power plant operation.

Distribution of coal needs close supervision. It is sometimes necessary to burn various grades of coal on a railroad. Under such conditions the distribution should be regular. Proper tonnage rating of locomotives is a factor. Where engines can be assigned to individual enginemen it will go a long way toward conserving fuel because of the personal interest the enginemen manifest in the condition of the engines assigned to them. Efficient yard operation and dispatching of engines and trains, as well as not overloading the tenders, are important features. In fact, nearly every phase of operation is directly or indirectly related to fuel consumption, and it is this relation that must be considered to get the desired result.

Our mechanical departments must understand that they are largely responsible for fuel conservation or waste, at least to the extent that they are permitted to spend money. An engine that does not economically burn coal should be kept out of the service until conditioned. We have on the market a number of devices and improvements which have been demonstrated as coal savers. All may not agree on the merits of these devices, but I think it is well worth every mechanical man's time to watch and study the development and performance of every improvement and device designed to save coal.

Stationary boilers must be kept in good condition and a systematic method of inspection and to insure economical operation, and the results obtained posted to promote interest of the operators.

Further, roundhouse equipment, such as hot water boiler washing plants, water treating plants, plenty of ash pit room and modern coaling stations are important. These, of course, are expensive items, but the savings produced as a result of such expenditures have demonstrated that it is money well spent.

Our existence today depends upon coal. It moves our commerce. It prepares our food. It heats our offices and homes. Just because we see it in large volume should not detract from its value. It should be indelibly impressed on the minds of everyone that fuel conservation is needed and

can be accomplished to a large extent, and that the money so saved can be applied to the general good of the properties upon which we and our families are dependent for a livelihood.

President Robinson spoke in part as follows:

President's Address

FUEL ECONOMY was long considered purely a mechanical department matter, but this association has for years advocated the policy of arousing all the departments to a realization of their share in the responsibility. There are at present many of our members, who may be classed as transportation or operating officers and much has been gained through papers and addresses delivered at previous meetings by general managers, general superintendents and other operating officers.

It is most encouraging that the executives of our railroads through the American Railway Association have so fully recognized the magnitude of the fuel problem and have urged and encouraged all departments toward greater interest in fuel conservation.

The Fuel Association's Committee on Fuel Tests in conjunction with the University of Illinois, and the United States Bureau of Mines, completed during 1917 at the locomotive testing laboratory of the University of Illinois, a series of tests of six sizes of coal from the same mine located in Franklin County, Ill. These tests developed that on a modern Mikado locomotive at the high rate of evaporation the 1½ inch screenings are worth only 94 per cent as much as 2 in. screenings for stoker firing; and 2 in. screenings only worth 87 per cent as much stoker fired as mine run hand fired.

It was the original intention that similar and additional tests be made of coal from the various fields throughout the country. Due to the war, the matter has been held in abeyance, but within the past year the Special Committee has suggested to the American Railway Association that a continuation of the tests would be desirable and it is hoped that favorable consideration will be given this matter at an early date.

While little accurate data has been made public other than the University of Illinois tests, already referred to, concerning the relative efficiency of various sizes of coal, it can be stated that the matter of size depends to a large extent on the description of the coal considered, whether low or high volatile, coking or non-coking. However, from the results of the laboratory tests at University of Illinois as well as various road tests, it may be definitely stated that the physical characteristics of coal constitute a factor equally as important as the B. T. U. value in so far as concerns the effective burning of coal on grates in locomotives. The coal mining interests can do much to assist the railroads in reducing fuel consumption through decreasing the stack loss, by furnishing them coal with as low per cent of fineness as practicable.

It would appear that the railroads can with profit frequently conduct road tests to determine sizes best suited to their needs, and some roads have given consideration to this feature.

It may be of interest to mention briefly the results of some road tests which may serve as suggestions for further checking by laboratory tests, similar to those which have already been mentioned.

Comparison of Two Varieties of Coal in Two Sizes: A Mikado locomotive, 26 in. by 32 in. cylinders, 64 in. drivers, 54,587 lb. tractive effort, equipped with superheater arch and Street stoker, was tested on the road with dynamometer car and test conditions controlled as closely as practicable. Two varieties of coal in two sizes for each variety were used stoker fired in order to determine their relative econ-

omy. Description, proximate analyses and comparative performance of the coals were as follows:

	Fairmont high volatile		Myersdale low volatile	
	1½-in. N. P. & S.	¾-in. Slack	Mine run	1½ in. Screenings
Moisture	1.23	1.57	0.75	0.81
Volatile	36.47	35.74	18.17	17.52
Fixed carbon	53.94	52.78	69.07	70.06
Ash	8.36	9.91	12.01	11.61
Sulphur	2.59	3.30	3.33	2.31
B. t. u. (calculated)	13,100	12,900	13,800	13,870
Lb. coal per avg. h.p. hour	3.74	4.19	4.14	4.89
Equiv. evap. lb. water per pound of coal	6.71	5.98	6.62	5.50
Efficiency of boiler	46.6	41.9	46.1	38.0
Lb. coal per sq. ft. grate per hour	57.78	65.89	59.55	74.28
Value based on 1½-in. N. P. & S. 1.00	1.00	0.89	0.99	0.82

These tests indicate clearly the desirability of high volatile coal of as large size as permissible on stoker locomotives requiring screenings, unless length of haul or other factors make ultimate cost of low volatile coal equal or less.

Comparison of Two Mine Run Coals from Different Mines in Same Region: Similar tests were made of mine run coal (crushed by stoker in firing) from two mines producing from the same vein of coal but from different parts of the field. The coals were similar in analysis and heat content.

The results obtained showed that coal A was decidedly more economical. Consumption of coal B was about 15 per cent in excess of coal A per D. B. H. P. Hour. Equivalent evaporation with coal A was 17 per cent greater than with coal B. Boiler efficiency with coal A was about 16 per cent higher than with coal B. Coal B was the more friable coal running about 75 per cent slack, which is characteristic of the coal while coal A ran about 45 per cent slack.

Mine Run Coal Versus Two Inch Screenings: Dynamometer car tests were run with a Mikado locomotive of recent design under comparative conditions in slow freight service to determine the relative economy of high volatile mine run coal and N. P. & S. screenings from the same mine when the locomotive is equipped with the duplex stoker. The mine run coal averaged 45 per cent slack, the N. P. & S. screenings averaged 65 per cent slack, with average proximate analyses very nearly the same.

The results showed the following relative performance:

	N. P. & S.	Mine run	Per cent in favor Mine run
Pounds coal per h.p. hour	2.98	2.72	8.1
Pounds water per lb. coal from and at 212 degrees F.	8.44	9.59	13.6
Efficiency of boiler	58.18	66.04	13.5

These tests would indicate that stokers of type that can be supplied with mine run coal, might profitably be substituted for one requiring a special size coal or screenings.

The cost of fuel and the wages of train and engine crews totals 50 per cent or more of the expense of our railroads for conducting transportation. (Cost of haul of fuel over own lines is not included in total audited cost, but is a considerable item in connection with conducting transportation expense). The fact that the volume of traffic at present being offered for movement does not by a material amount approximate the capacity of the available transportation facilities, results in present average operating conditions under which congestion is largely eliminated.

The opportunity to reduce overtime wages and standby fuel consumption through reduction of delays on line of road and extension of locomotive runs through intermediate terminals is presented by these conditions and many railroads

are taking advantage of this opportunity to reduce the transportation expense.

Caution is required, however, to insure that the increase in speed of movement is not made at the expense of too great

a reduction in the train load. The index of gross ton mileage produced per unit of combined wage and fuel expense should be employed as a check to determine the relative economy of performance.

Locomotive Feed Water Heaters

IN ORDER that definite information might be obtained as to the operation and maintenance of the Locomotive Feed Water Heaters, a questionnaire was compiled and sent to the presidents of 137 railroads in the United States and Canada. Answers were received from 78 of these roads, 20 roads having feed water heaters.

In 1920 there were seven roads using feed water heaters. There are now 28 American roads with five types of heaters on order or in service. The number of the different types of heaters in use or on order are as follows:

The Superheater Company's feed water heater.....	93
Worthington feed water heater.....	136
Weir feed water heater.....	1
Simplex Blake Knowles feed water heater.....	3
Local type.....	1
Total heaters applied or on order.....	234

The advisability of extending the use of locomotive feed water heaters is strongly recommended by five railroads; the other roads consider that the process of development is yet in the experimental stage and are waiting until further tests show that the economy derived will justify further application.

The application of feed water heaters has not been limited to any single class of power or service. The largest locomotive equipped with a feed water heater is a Mallet type of 107,961 lb. tractive effort, while the smallest is an American type of 24,000 lb. tractive effort. Other types of locomotives to which feed water heaters have been applied are Mikado, Pacific, Consolidation, Mountain and locomotives in suburban service. These locomotives operate in both passenger and freight service on mountainous and rolling territory. Both coal and oil are used for fuel.

One of the most important considerations in the selection of the type of feed water heater to be used, is the character of the water in the territory through which the locomotive is to operate. In bad water districts, the open type heater seems to be preferred, as the scale deposits on the tubes of the closed type heater retard the heat transmitted and reduce the efficiency of the heater, and there would be less danger of boiler trouble from oil due to the frequent washouts. No road has reported trouble from oil from the feed water in the boiler. Roads where the boiler washout period averages 30 days generally prefer the closed type of feed water heater.

Three roads have reduced the size of the exhaust nozzles on application of feed water heaters and one road has enlarged the nozzle. The reduction in the size of the nozzle is done in order to offset the loss in superheat temperature which occurs when a feed water heater is applied to a locomotive. This is not considered advisable, as the reduction of the size of the nozzle increases the back pressure, which will probably offset any saving that would be effected by the increased superheat.

There has been no difference reported in the amount of boiler scale in boilers equipped with feed water heaters over the other engines.

The open type heater has in all cases gone from shopping to shopping without cleaning, regardless of the water conditions. While going through the shop the scale deposit is scraped from the inside of the heater, no acid or cleaning solution being used.

In good water territory, the closed type of heater is cleaned each time the locomotive is shopped. The usual method of doing this is to dip the tube nest into a lye vat to remove any oily deposit which may have formed on the outside of the tubes. In districts where the water conditions necessitate more frequent cleaning, the deposit is either washed

out by flushing the heater with water or, if the scale is not soluble, a dilute solution of muriatic acid is pumped through the heater for a short time and then water is pumped through to clean out the acid. The strength of the acid varies from 20 to 33 1/3 per cent, depending on the nature of the scale.

The highest cost of cleaning the feed water heater is \$170.00 per year, both labor and material, and the lowest cost is \$2.31. In one case the heater is cleaned by the use of dilute muriatic acid. The other, by a basic solution. An average of the cost data submitted by all the roads for cleaning by the acid process is \$62.19 per heater per year, which includes both labor and material.

The cost of other maintenance of the heater proper per year is practically nothing on both the open and closed types. Where weak acid solutions are used, none of the heaters cleaned show any signs of deterioration due to the use of the acid. The territory in which locomotives equipped with feed water heaters operate, includes the greatest range of climatic conditions possible. No serious difficulty has been encountered with any of the feed water heater systems freezing up. Drain valves and telltale pipes have frozen up, but these have given no further trouble after properly lagging.

Failures of the heater proper while in service have occurred, due to tubes bursting or becoming loose in the tube sheet, heater heads cracking with the closed type of heater, and a crack developed in the cylinder near the discharge valve on the open type of heater. The brass tubes in the closed heater have been replaced by copper tubes, which are more ductile than the brass and a better joint can be made when the tubes fasten into the header. Some trouble has been experienced with the boiler checks pounding out or breaking off with the use of feed water heater equipment. This has been largely overcome by using larger boiler checks with reduced lift.

The boiler feed pump has given good service with all types of heaters. The most common defects which have been encountered are the pump piston rod packing leaking, rods wearing, water valve springs breaking, water cylinder scoring, top head pump gasket leaking, abnormal lift of intake and outlet valves, and valves stuck or leaking. The average cost of maintenance per pump, taken from the data submitted, is \$55.16 per year, which includes both labor and material.

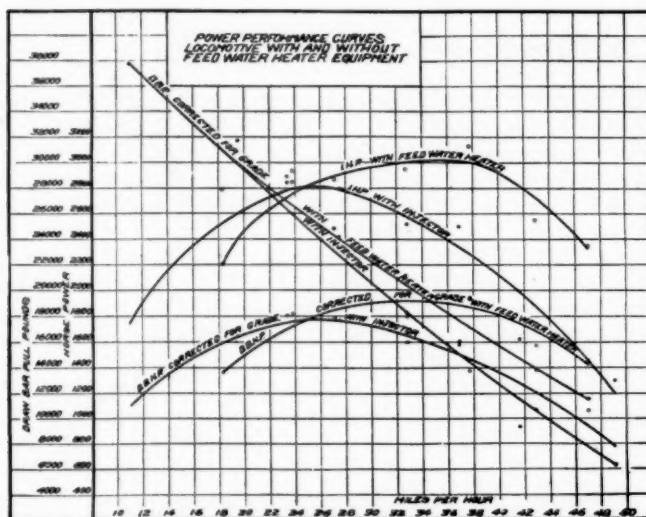
The cost of maintenance of the feed water heater apparatus complete averages \$97.15 per locomotive for labor and material per year. This figure was determined by averaging the maintenance costs submitted by all the roads, regardless of the type of heater used.

As all the locomotives, which are equipped with feed water heaters, have an injector, no engine failures could be attributed to the operation of the feed water heater apparatus, as the injector was used to supply the boiler in case of the failure of the feed water heater.

Where feed water heaters are applied, the enginemen should be personally instructed relative to the operation of the equipment in order that the highest efficiency may be obtained. The feed water heater pump should only be used to supply the boiler when the engine is working steam, as the exhaust steam from the auxiliaries is not sufficient to heat the water hot enough to show a saving, and the introduction of the cold water into the boiler would tend to cause serious strains in the flues and flue sheets. The rule to pump locomotives with feed water heaters only when

working steam, is in force on very nearly all the roads using this device.

It has been possible to eliminate some water tank stops



Results of Dynamometer Tests With and Without Feed Water Heaters

when the condensate from the feed water heater is returned to the boiler.

On tests made on feed water heater locomotives, the feed water heater shows a saving of between 10 and 16 per cent in fuel, based on the evaporation performance of the locomotive. On two roads where dynamometer car tests had been conducted on feed water heater locomotives, there was a saving of approximately 10 per cent based on fuel consumption per drawbar horsepower. On a thousand ton mile basis, the saving as shown by the different roads varies from 4 to 11 per cent.

The accompanying power performance chart is based on data taken on dynamometer car tests. It shows that with the feed water heater locomotives, there is an increase of both indicated and drawbar horsepower. This increase in horsepower is due to the back pressure being decreased by diverting about 12 per cent of the exhaust steam from the cylinders

to the feed water heater, thus increasing the steaming capacity of the locomotive at high speeds. This increased horsepower will permit an increase in the tonnage rating and average speed of the locomotive, either in time freight or passenger service.

In its present form the locomotive feed water heater has passed through the experimental stage in this country and the results indicated in this report are typical of what may be anticipated from the application of feed water heaters on other railroads, barring unusual local conditions.

At the present time, the exhaust steam injector as extensively used abroad is being considered as an alternative to the open type of locomotive feed water heater. One American firm is already engaged in the manufacture of this device, and arrangements are being perfected for supplying the railroads in this country with a type of exhaust steam injector that has been successfully used on an extensive scale in England and her colonies.

The report was signed by E. E. Chapman, chairman (A. T. & S. F.); J. R. Alexander (Penn.), E. A. Averill (Superheater Company), J. A. Carney (C. B. & Q.), J. N. Lammedee (Worthington Pump & Mch. Corp.), L. P. Michael (C. & N. W.), Geo. E. Murray (Grand Trunk), C. B. Peck (Railway Age), L. G. Plant (Railway Review), G. B. Von Boden (Sou. Pac.), W. H. Winterrowd (Can. Pac.).

Discussion

H. B. Oatley (Superheater Company), called attention to the fact that feedwater heating has been practiced as long as the injector has been used to feed the locomotive boiler, although in the line steam injector the heat is taken direct from the boiler and is not reclaimed. He then referred to the exhaust steam injector, which has been used extensively in England and the British Colonies, and said that from seven to eight pounds of water could be passed from the tank to the boiler for each pound of steam condensed in the injector; the exhaust steam alone at one, three and five pounds pressure being capable of delivering against boiler pressures of 150 lb., 165 lb. and 180 lb. respectively. A small amount of line steam is required to supplement the exhaust steam for delivery against higher pressures. Mr. Oatley suggested that the possibilities of heat reclamation with the exhaust steam injector compare favorably with those of other types of feed water heaters.

A Division Superintendent's Interest in Fuel Conservation

By S. U. Hooper

Division Superintendent, Baltimore & Ohio

LET IT BE definitely understood that this is strictly a non-technical paper. The very nature of the subject makes it desirable that it be treated in a non-technical way. Bearing in mind that many of our largest railroad systems still cling to what is generally termed the divisional form of organization, oftentimes putting at the head of a divisional unit a man whose sole claim to shouldering that responsibility is his general ability to co-ordinate, regulate and stimulate all of the numerous phases which go to make up successful operation, it will be seen that there is a decided place for the general or non-technical treatment of fuel conservation.

It requires the mechanical specialist and the fuel expert to determine the proper grade of fuel and the proper design of locomotive. But the battle is then only partially won. It also requires the competent road foreman, the able supervisor, backed up by the operating officer, to insure the successful operation of correctly designed and maintained locomotives supplied with the carefully selected and prepared fuel. Too much stress, therefore, cannot be laid upon the well established policy of this association in getting its purpose before, and in arousing the interest of, every so-called strictly operating officer.

Now comes the question of the relative importance of the fuel problem from a superintendent's viewpoint.

Operating economy consists primarily in keeping down his wage and fuel costs, and, of these factors, fuel cost amounts to approximately one-third of the total expense. Is it any wonder, therefore, that the subject should be rightfully given a very considerable proportion of the operating officer's study and attention? And is it not self-evident that the subject is so large, and so important, that it should be handled by the boss himself? He is the father of his entire divisional organization, and particularly that important part known as his staff. His main function is to educate, to devise ways and means whereby the most up-to-date methods and the most advanced tactics can be effectively placed before his subordinates, on whom he must rely to pass the gospel to the men. It lies largely with him whether harmony is going to exist in his family, and genuine success is not going to be his unless the representatives of all his departments pull together. It is not only his prerogative, but his duty, to press constantly on the identity of interest until the various members of his staff are co-operating for the accomplishment of what is best for the division and the railroad as a whole, burying everything which might savor

of department influence. It rests with him to determine such delicate matters as inter-departmental relationships. One department must not be allowed to profit in showing at the expense of another. Specifically illustrating, fuel conservation must not be sacrificed in order that maintenance expenses may show a reduction.

The success of any movement lies in getting the objects to be accomplished, and the methods whereby they are to be accomplished, to the men who are actually performing the work. As the superintendent comes in frequent close contact with the men who are handling his trains, he is indeed in a position to reinforce the educational measures of his staff officers and can do much towards stimulating, on the part of the men, a genuine interest and desire to carry out the program.

It is scarcely necessary to deal in detail with the many other ways in which the superintendent can prove himself the actual leader of his division in fuel conservation. It is fitting, however, to emphasize again the importance of the road foreman's monthly fuel meetings, for these occasions bring to the superintendent a glorious opportunity not only to familiarize himself thoroughly with what is transpiring on the division, but the chance of getting directly before his employees an expression of what can be done in the saving of coal. On such divisions as enjoy superintendent's staff meetings, open also to the employees, fuel conservation subjects should invariably occupy a prominent place on the program. It will sometimes be found surprising, as well as gratifying, to note how much interest can be aroused by an enumeration in simple form of divisional operating statistics, especially as affected by fuel costs, savings, etc. The employees feel that they are entitled to this information and in possessing in their identity of interest with the employer is materially strengthened. An occasional remark showing that the superintendent is familiar with the enginemen and firemen who are making the noteworthy fuel performances is oftentimes productive of real interest and competition on the part of the employees.

As the direct connecting link between the division and the general officers, the superintendent is in the best possible position to call attention to, and urge such improvements in, the physical condition of his division as will bring about additional fuel economies.

Among the many possibilities which the present day holds

for progress in fuel conservation should be named the proper relation of tonnage to speed in producing fuel efficiency. The endeavor to find the economic speed at which a locomotive will produce the least expensive transportation has not yet achieved complete success. In the solution of this problem alone the results to a superintendent should more than repay all his efforts. Granting that wages and fuel constitute by far the major portion of train operating expense, tabulating the results of a series of experiments, the varying factor in which will alone be the train tonnage, should, and does, place us in a position to determine what train rating will produce the lowest wage and fuel expense per thousand gross ton miles. It has, within the past few months, been the privilege of the writer to engage in studies of this nature, but, unfortunately, the fluctuating traffic conditions have thrown our computations, thus far, badly out of line.

Closely allied to these tonnage experiments, is another evolution of transportation improvement, namely, increasing the length of through freight and passenger runs. The idea is by no means a new one, but its recent adoption by many of our most progressive railroads shows that operating officers are today leaving no stone unturned. Logically, a locomotive should be operated over the longest possible territory that good maintenance of power will permit. An investment such as is represented in the modern locomotive should be producing transportation as great a proportion of the twenty-four hour period as proper maintenance will allow. Recent experiments have shown conclusively that with proper attention at the dispatching terminal, engines can easily be prepared to withstand longer runs, intermediate terminals can be dispensed with, engine mileage increased, and a decided fuel economy effected.

It is in the solving of such problems that a superintendent can perhaps do his most constructive work for fuel conservation. The opportunity is his, for he alone has all the necessary machinery at his disposal.

In conclusion, let the superintendent ever remember that unless he is thoroughly acquainted with the fuel problems on his division, and unless he takes such an active part in the solution of those problems, his subordinates and employees will not be impressed with the importance and possibilities of fuel conservation, and can not be censured if they do not display a whole-hearted interest in the subject.

Front-Ends, Grates and Ashpans

THE REPORT of the committee was chiefly a summary of and comment on existing conditions and recommended practice as presented in previous reports.

Front-Ends

Master Mechanics' Standards.—The Master Mechanics' Association in 1906 recommended standards for front-end design. The great increase in the size of locomotives has brought about departure from these standards even in locomotives using saturated steam, and the widespread use of superheaters has necessitated still greater deviation. There are comparatively few roads which now adhere to the standards recommended by the Master Mechanics' Association 16 years ago.

Bridged Nozzles.—The committee has previously recorded its opinion that a bridge in the nozzle is useless. It has recommended that in cases where it is desired to sharpen the draft, the nozzle tip be replaced by a plain tip of smaller diameter instead of applying a bridge to the old tip; and it has maintained that better results can be obtained from a plain circular tip than from a bridged tip of equal net area. There continues to be, however, a decided difference of opinion on this point and there are still a great many advocates of nozzle bridges.

Height of Nozzle and Stack Entrance.—The exhaust jet

acts by entraining the gases along its surface, and the committee in 1916 pointed out that we get the maximum entraining surface, and consequently the maximum efficiency of the jet, by having the jet as long as possible. It suggests therefore a low table plate and low exhaust nozzle combined with a stack placed with its lower edge as high as practicable. It pointed out also that this practice has an incidental advantage, in that a low table plate allows the maximum netting area. A study of current designs indicates, however, that there are numerous deviations from these recommendations, the reasons for which would doubtless be of interest.

Adjustable Draft Pipes.—In the report of 1916 the committee expressed its preference for the extended drop stack as compared with the separate draft pipe, and it supports this view thus: "The adjustable petticoat or draft pipe seems to be disappearing, and this we believe to be consistent. Under some conditions it is possible that a double draft pipe may improve an otherwise faulty design, but under no conditions is it believed that results can be obtained by their use which are as successful as the more modern arrangement. In place of the petticoat pipe the extended or drop stack is employed, with a generous flare at the bottom, and run as high above the nozzle as can be done and still clean the table plate. With this plan we do not believe that over-draft is necessary or desirable."

Special Front-end Arrangements.—The committee has at various times called attention to special front-end arrangements, especially to those using radically different arrangements of the netting and nozzles of unusual shape or cross-section. Special forms referred to in previous reports are the Slater or Mudge-Slater front-end, a front-end in use on the Burlington "differing widely from that of other railroads so far as form is concerned, having a basket form over the exhaust pot," the so-called "Unit Spark Arrester" on the Rock Island, and the Lewis front-end.

Air Leaks.—While it is generally understood that leaks into the front-end cut down the available draft and entail losses in efficiency which must ultimately be paid for in coal, it is nevertheless not uncommon to find front-end air leaks.

One of the commonest and most serious front-end leaks in modern locomotives occurs at the point where outside steam pipes pass through the front-end shell. F. P. Roesch, in his paper in 1919, suggested a method of stopping this leak which is in use on several roads. It consists of welding a ring of thin sheet iron around the pipe at this point. The Union Pacific System, for example, uses a sheet of iron of about No. 16 gauge, which has circular corrugations to give it flexibility, and which fits snugly about the steam pipe. It is placed inside the shell and is welded to both the shell and the pipe.

Grates

Air Openings in Grates.—The committee has previously recommended that for the majority of coals in use, the air openings through the grates be as great as is compatible with the mechanical strength of the grate bars. The data secured by the committee for its reports of 1915 and 1916 show that on locomotives burning bituminous coal the air opening in the grates in service runs as high as 70 per cent, although this is rare. Fifty per cent air opening is not uncommon, and the average of the designs reported to the committee was about 40 per cent. On locomotives burning anthracite coal the prevailing air opening averaged nearly the same amount, although the maximum was only 45 per cent.

It is obvious, however, that with certain fine and friable coals maximum grate opening will entail undue waste of coal through the grates; and it is unfortunate that many such coals, like lignite for example, are the very ones which, from the point of view of good combustion alone, ought to have maximum air supply and the greatest air opening in the grates. Such coals clearly call for a compromise in designing the grates. An interesting solution of this difficulty has been made by the Union Pacific in some of its locomotives burning a light fragile coal resembling lignite. In order to prevent excessive waste of coal through the grates, the grate openings have been kept moderate in size. The air drawn through the grates is consequently insufficient for good combustion, and in order to supply the necessary additional air they provide a small air door which opens into the firebox above the fire. When the locomotive is in operation this door is open.

It is clear that the air opening through the grates must continue to be determined with some reference to the kind of coal in use, and that for many kinds of fuel grate design must be a compromise between the desire to obtain maximum air opening and the necessity of avoiding undue waste of coal. Under the circumstances, probably no positive recommendations can be made with respect to air openings which would be generally applicable and satisfactory for all fuels.

Table Grates vs. Finger Grates.—While the committee's investigations seem to show a tendency to substitute table grates for finger grates, there is little evidence to prove that under all circumstances there is any clear superiority of one type over the other. Each type can be so designed as to provide adequate air opening and strength; but there remains much difference of opinion as to the relative merits of the two, and it seems probable that the choice between them must be made with regard to the kind of coal in use.

Composition of Grate-bar Iron.—The proper chemical composition of grate-bar iron seems to have received but little attention and apparently the majority of roads have no standard specifications and accept any foundry mixture, notwithstanding the general belief that many grate-bar failures are traceable to unsuitable material. The committee in 1916 suggested a tentative mixture which had proven satisfactory.

Ashpans

The committee has previously presented data concerning such features of ashpan design as pan volume, dumping arrangements, slope of the sides, guards for preventing fire being thrown from the pan, and so forth. Most of these features are largely controlled by the general design of the locomotive.

Ashpan Air Openings.—The most important feature of ashpan design from the point of view of performance, and the one which is generally well within the designer's control, is the amount of air opening into the ashpan. On this point we have laid great stress and made definite recommendations, namely, that the area of this opening be not less than 14 per cent of the grate area. There are hundreds of locomotives in service in which this standard is not attained and where the ashpan opening does not amount to much more than half of the 14 per cent proposed. We wish again to emphasize the importance of complying with this standard.

General

Standards of Older Locomotives.—While gratifying progress has been made in the design of drafting arrangements in the last ten years, and while the majority of recently built locomotives have well designed front-ends, grates and ashpans, we would call attention to the fact that no such progress has been made in re-designing these parts on older locomotives. There is a profitable field for improvement here in bringing up to modern standards such fundamental features of design as grate opening, ashpan opening, etc.

In concluding its report the committee wishes to emphasize the fact that, in designing and maintaining locomotives, front-ends, grates and ashpans must be given equal consideration. They make up, together, the drafting system of the locomotive and consideration of the one cannot safely be divorced from that of the others. Excellent front-end arrangements may be rendered ineffective by poor grates or by poor ashpan design.

The report is signed by Edward C. Schmidt (University of Illinois), chairman; W. J. Bohan (Nor. Pac.); M. C. M. Hatch (M. K. & T.); V. L. Jones (N. Y., N. H. & H.); G. R. Likert (U. P.); John P. Neff (American Arch Co.); F. C. Thayer (Southern); G. A. Young (Purdue University), and F. Zeleny (C. B. & Q.).

Discussion

M. H. Haig (A. T. & S. F.) emphasized the necessity of taking the ash pan seriously in designing new locomotives, rather than fitting in whatever can be gotten in after the rest of the design is complete. Not only is it necessary to provide ample air opening, but the sides should slope under the mud ring sufficiently to prevent an accumulation of ashes which will restrict the openings when the engine is in service. He suggested that it would be worth while to modify the trailer truck and frame design as well as the mud ring slope, if necessary, in order to secure a good ash pan design.

Papers were also presented by G. M. Basford, on Locomotive Fuel, by J. B. Davenport on Effects of Speed and Tonnage Rating on Fuel Consumption, by O. S. Beyer on Incentives for Promoting Fuel Economy and by D. C. Buell on Educational Work for Fuel Economy. Other committee reports were presented on Fuel Accounting and on Firing Practice. These papers and reports will be published in future issues. Proceedings of the later sessions of the convention will appear in next week's issue.

N. Y. Central Surplus After Dividends, \$9,747,588

Operating Expenses Reduced 26 Per Cent from 1920. Transportation Ratio for 1921 Only 38.53

THE NEW YORK CENTRAL'S annual report, issued on Thursday of the present week, shows a net after interest and other fixed charges of \$22,295,686, and after the 5 per cent dividends and sinking fund appropriations, a surplus carried to profit and loss of \$9,747,588. There was, however, included in the income amount for 1921 items aggregating \$5,613,183, representing adjustments in that year which related solely to the federal control and guaranty periods. If these items be deducted from the 1921 figures the surplus for the year would be \$4,134,404. The 1920 surplus after dividends was \$1,250,256. In 1916 and 1917, the last two years before the advent of federal control, the Central's surplus after dividends was respectively \$30,692,606 and \$13,004,054.

The operating results obtained by the New York Central in 1921 approach the spectacular as compared with 1920. In 1921, as compared with 1920, the road had to contend with a falling off in its revenue tonnage of 33 per cent and a reduction in total operating revenues of 13.73 per cent. On the other hand it reduced its operating expenses 26.47 per cent. In 1921 the road had an operating ratio of 78.24 per cent, while the transportation ratio was 38.53.

The year 1921 was signalized on all railroads by the drastic manner in which operating expenses were taken in hand and the degree by which they were reduced through lower costs of materials, lower wages and greater efficiency. The New York Central's reductions were in even greater proportion than those of other roads, except in the case of maintenance of way. Its reduction of 26.47 per cent in total operating expenses compared with a decrease, as compared with 1920, on all the Class I roads, of 17.8 per cent. Its reductions in expenses for maintenance of way figured out at 13.02 per cent; the Class I roads' average was 23.4. Maintenance of equipment was reduced 30.91 per cent; the Class I roads' reduction in this item was 18.4 per cent. The Central's reduction in transportation expenses was 29.30 per cent. The Class I roads, as a whole, decreased their transportation expenses in 1921, as compared with 1920, 17.4 per cent. The foregoing figures are those for the New York Central Railroad and exclude those for the Boston & Albany which are shown separately in the report.

Approximated Pre-War Operating Results

The final result of all this was, that in spite of the unfavorable 1921 conditions, the New York Central approximated its pre-war average earnings from its own operations. The New York Central's standard return was \$55,802,630, excluding additional compensation accrued on account of completed additions and betterments. In 1918 and 1919 it fell short of wholly earning its governmental rental. In 1920 it had a net after rentals approximating \$4,000,000. This amount, however, was lowered by certain maintenance equalization reserve charges of over \$7,000,000, which, upon the elimination of this reserve in 1921 were credited in the 1921 accounts. The 1921 net after rentals was \$54,938,035. Excluding the credit items to maintenance, just noted, this would have been about \$47,000,000, in either case a very substantial increase. This result was, of course, obtained with higher rates—the receipts per ton per mile were 1.208 cents in 1921 and 0.93 cents in 1920—but with greatly reduced tonnage and with extremely rigid control over operating expenses. It indicates the Central's earning power and its ability to come through under adverse conditions.

The 1921 net railway operating income, representing the results of the New York Central Railroad's own operations, made up about two-thirds of the company's total gross income. This figured up to \$75,097,499 and compared with \$61,788,441 in 1920. The earnings of the affiliated New York Central properties—those controlled by majority stock ownership—are shown in the New York Central's report under "other income," which, in 1921 totaled \$20,121,944. Included in this there was dividend income of \$6,316,257; income from funded securities, \$3,171,613, and from unfunded securities, \$2,783,073. The leased, but separately operated, Boston & Albany, had a deficit after its rental payment of \$1,351,943. The peculiarity of the New York Central's large financial structure is its comparatively large interest charges. Of the total deductions from gross income in 1921 of \$52,801,813, there was included \$33,598,469 interest on funded debt, \$7,196,207 interest on unfunded debt and \$6,703,481 rent for leased roads. The 5 per cent dividends at a rate of 5 per cent total \$12,479,641. It seems to be a consensus of opinion among students of the New York Central affairs that the interest charges of the property are not at all excessive. It is frequently observed, on the other hand, that the dividend obligations are comparatively low considering the earning power of the property. The 1921 operating results seem to bear out this contention and, if the contention is correct, it means that with the restoration of more normal times in American railroad-ing, the New York Central should find itself in a very favorable condition from the standpoint of raising new capital.

The total tons of revenue freight carried on the New York Central Railroad, exclusive of the Boston & Albany, in 1921, were 74,475,185, as compared with 110,753,433 in 1920. In other words, there was a reduction of 32.76 per cent. The New York Central has a very diversified tonnage and the reductions in 1921 were general in nearly all classes of commodities with the exception of the classifications given under products of animals. The road gives figures both for car loads and tons. The reduction in bituminous coal traffic was from 727,724 cars in 1920 to 481,869 in 1921. The tonnage in 1921 was 24,819,033, a decrease of 11,796,997 from 1920. The road also had a very drastic cut in its iron ore traffic, as is shown by the fact that in 1921 it moved 45,178 cars, or 127,970 less than in 1920. Shown in tons this reduction was 7,167,030.

Reserves for Maintenance Equalization

The road's total railway operating revenues were \$292,130,995, as compared with \$338,624,456 in 1920, a reduction of \$46,493,461, or 13.73 per cent. As has been previously noted the reduction in operating expenses was 26.47 per cent, the actual figures being in 1921 \$228,571,355 and in 1920, \$310,870,826, the difference as between the two years being \$82,299,471. These figures of operating expenses, as given, eliminate the adjustments for equalization of maintenance which the New York Central made in 1920. The report explains the situation by saying that "in arriving at the operating income for the guaranty period, the Transportation Act required that the maintenance allowance should be fixed with reference to the standards and price levels of the test period. The company worked out a tentative factor which resulted in charges to maintenance in excess of the actual expenditures and the carrying forward of a reserve at the end of 1920. This factor, however, has

proved to be larger than the government is likely to accept. Therefore, entries were made in December, 1921, closing out balances in the maintenance reserves which had been accumulated in 1920 . . ." The larger part of the maintenance reserve in question was in maintenance of way. The 1920 statement of primary accounts showed an item, "equalization of maintenance," \$6,928,347, and the 1921 accounts, a credit of \$6,802,965. If the equalization items were included in the total operating expenses as a debit in 1920 and a credit in 1921, the figures would show total operating expenses in 1921 of \$221,768,390; in 1920, \$317,799,163, a reduction of \$96,030,783, or 30.22 per cent. In this use also the operating ratio for the year would be 75.91, as compared with 93.84 in 1920. If the equalization items be excluded the operating ratio for 1921 would be 78.24.

The expenses for maintenance of way were reduced from \$40,956,006 in 1920 to \$35,621,006 in 1921 or a reduction of \$5,334,300. These figures eliminate the equalization of maintenance items. The New York Central does not give, in its report, any figures showing the amount of material used for maintenance but it is shown in classified expenses that more money was spent in 1921 than in 1920 for ties, rails and other track material and that the reduction in ballast was small, which indicates that the savings in maintenance were due to increased efficiency and lower costs.

The expenses for maintenance of equipment for 1921 totaled \$64,455,871, a reduction of \$28,840,877 from the 1920 figure of \$93,296,748. The larger part of the reduction was in repairs to locomotives and cars. The steam locomotive repairs in 1921 were \$7,749,517 and freight car repairs were \$21,128,117. The result is shown in a figure for May 1 of 19.3 per cent bad order cars and of 30.9 per cent locomotives out of service for repairs requiring over 24 hours. These figures are unusually high. The average bad order car percentage for all roads on the date given was 14.4 and the unserviceable locomotive per cent, 20.2. The New York Central's high percentage figures indicate, if one judges correctly, that the road has before it some large expenses to be met for repairs or retirements of equipment. It is understood, however, that the road at present is handling its traffic extremely well and is not having any operating difficulties due to car or locomotive shortage.

Present Operating Efficiency

It was noted above that the New York Central in 1921 had a transportation ratio of 38.53, which indicates operating efficiency of a high order. The 1920 figure was 47.01. The transportation expenses in 1921 were \$112,561,539, as compared with \$159,203,029 in 1920, a reduction of \$46,641,490. This saving, which amounted to 29.3 per cent, was primarily due to the reduction in revenue tonnage and to savings in wage and fuel costs. The savings in fuel for locomotives totaled approximately \$10,000,000.

This is a good place to bring out some rather interesting points in connection with the New York Central's present operating efficiency. It is, of course, worthy of more than ordinary attention that a concern the size of the New York Central should have been able to take such a drastic hold upon its expenses as it did in 1921. The New York Central further has been doing some rather remarkable work in connection with its fast freight service. The road is rapidly regaining its former strong position in fast freight service between New York and the West and at the present time it is giving the other competing lines some interesting competition. The road, of course, has an advantage in this fast freight service because of its lack of grades, and it now is in a position to secure the advantage of the large equipment purchases which it has made in the past several years. This point is worth bearing in mind in connection with the statement made above that the percentage of unserviceable locomotives at present is unusually high. The locomotive

condition is certainly not being reflected in the manner in which the fast freight service is being handled. It is our understanding that shippers are extremely well pleased with the New York Central service.

Earnings in 1922 Should Be Good

The evidence would be that the New York Central should be able to do much better in 1922 than it did in 1921, and it will be remembered that in 1921 it came close to operating on a pre-war basis. In March of this year the road had a net after rentals of \$4,555,930, as compared with \$3,072,946 in March, 1921. Its three months' figure was \$11,612,442 as against \$3,008,576 in the first three months of 1921. The operating ratio for the first quarter of 1922 was 79.30.

The road's coal traffic is at present running very low on account of the coal strike. Since April 1 the weekly loadings of coal had been about 200 or 300 cars weekly, whereas in March and April last year they were nearer 1,500 or 2,000 weekly. Nevertheless, in spite of the lack of coal traffic the total loadings are considerably in excess of those of the comparative period last year. This bears out the theory of the optimists that business is now meeting its revival and makes one feel rather optimistic also about New York Central. The whole thing, of course, is involved in the result of the rate decision. The road, however, should be able easily to make up in increased tonnage what it may lose in the 10 per cent reduction in rates.

It is a peculiar feature in New York Central operations that the company always seems to be engaged in doing something unusual on a large scale. For the past few years the leading element in this connection has been its large purchases of equipment. It has continued these purchases in 1922, its orders for 17,000 freight cars for the entire system having recently been reported in the *Railway Age*. Another very important development which has recently been put under way is the new bridge over the Hudson river at Castleton, N. Y., and the accompanying facilities. This project will cost some \$20,000,000. An article concerning it appears on another page of the present issue.

Another interesting feature in recent New York Central development is its acquisition of the Chicago River & Indiana and the Chicago Junction which will greatly improve the system's position at Chicago. The Commission's decision approving, with certain conditions the proposed acquisition, will be found on another page. Details have appeared in the *Railway Age* concerning the passenger terminal development at Cleveland.

Big Four and Toledo & Ohio Central

The New York Central has offered to acquire additional stock in the Cleveland, Cincinnati, Chicago & St. Louis. This company has outstanding \$9,998,500 preferred and \$47,028,700 common. The Central at present owns \$30,207,700 of the Big Four's common stock, or 52.97 per cent of all its outstanding stock. It has offered to purchase the remaining Big Four stock on a basis of one share of New York Central to one share of the Big Four's \$9,998,500, 5 per cent preferred and at the rate of 80 shares of Central for 100 shares of Big Four common. Stockholders have authorized the issue of \$23,478,800 common stock for the purpose. The application to the Interstate Commerce Commission is still pending.

The New York Central board of directors, on December 14, 1921, authorized a lease of the Toledo & Ohio Central and also leases of the Kanawha & Michigan, the Kanawha & West Virginia and the Zanesville & Western. These companies are now made parts of the New York Central system by entire stock ownership, except a few shares of the Kanawha & Michigan. The proposed leases will have the advantage of offering the possibility of substantial economies in operation and accounting.

Edmund Pennington Becomes Chairman of the Soo

The New President Is George R. Huntington, Formerly Vice-President and General Manager

FOLLOWING OUT an intention entertained for a considerable time, Edmund Pennington, president of the Minneapolis, St. Paul & Sault Ste. Marie, appeared before the board of directors on May 16 to announce his desire to retire from active service, and to request that he be relieved of the responsibilities of chief executive which he has carried for 11 years. In acceding to this request the board elected as his successor G. R. Huntington, vice-president and general manager, and elected Mr. Pennington to the newly created position of chairman.

Edmund Pennington

In turning over the active control of this property to a younger man Mr. Pennington, who is 74 years of age, rounds out more than half a century of continuous active railway service, 38 years of which have been with the Soo Line and

Toronto and the east. A 260-mile extension was also soon built from Glenwood, Minn., to Noyes, forming a second connection with the Canadian Pacific and a short line between St. Paul and Winnipeg. Lines were built from Brooten, Minn., to Duluth and from Plummer, Minn., to Moose Lake to afford outlets for grain from central and northern North Dakota respectively to the head of the lakes at Duluth.

The Soo Line has also competed actively with the Great Northern for the control of traffic in northern North Dakota, building a line from Thief River Falls, Minn., west 300 miles to Kenmare, N. D., parallel to and midway between the main line of the Great Northern and the international border, which intersected 11 branch lines of the latter road. A short time later it then built another extension west from this point 136 miles into eastern Montana parallel to and a



Edmund Pennington



G. R. Huntington

its predecessor properties. During this period, largely under his direction, the Minneapolis, St. Paul & Sault Ste. Marie has expanded from a road of approximately 800 miles as formed in July 11, 1888, by the consolidation of the Aberdeen, Bismarck & Northwestern; the Minneapolis & Pacific; the Minneapolis & St. Croix and the Minneapolis, Sault Ste. Marie & Atlantic, to a system of some 4,400 miles.

The Soo Line is controlled by the Canadian Pacific; its development has therefore been designed to supplement the facilities of the parent system. Thus one of the earliest lines built in the program of expansion was that from Hankinson, N. D., northwest 350 miles to Portal, on the Canadian border, where connection was made with the Canadian Pacific, affording an alternate route south of Lake Superior for grain and other traffic moving from points in western Canada to

short distance south of the border. It was while Mr. Pennington was vice-president that the Soo Line acquired an entrance into Chicago through the lease of the Wisconsin Central, a property of approximately 1,000 miles extending from Chicago to St. Paul and Minneapolis, with branches to Ashland, Wis., and Duluth, Minn. The most recent addition to the property was made on August 1, 1921, when the Wisconsin & Northern was acquired to provide a shorter route for traffic moving between the upper peninsula of Michigan and points south, including Chicago.

Mr. Pennington's career on the Minneapolis, St. Paul & Sault Ste. Marie, is inseparably connected with an era of widespread railroad expansion in the northwest, during which the property of which he has been chief executive, has established itself as an important transportation system in

the Lake Superior region and north Mississippi valley. With trunk lines extending from Portal, N. D., through the Twin Cities to Sault Ste. Marie, Ont., and from Chicago to Noyes, Minn., near Winnipeg and with a considerable mileage of branch lines in the timber and grain producing areas of the north, this road has become an important element of the trans-continental system of which it is a subsidiary.

While not a man of unusually wide acquaintance, Mr. Pennington has commanded the esteem of those who have come in contact with him. Although he has in general been conservative to the point of persistency, holding out against the adoption of some practices on the lines under his jurisdiction which have been readily adopted elsewhere, he has been aggressive in other respects, as in the development of the local freight terminal facilities at Chicago, which were the most modern in that city when completed in 1913. He has used his practical experience to good advantage throughout his administration and the comparative freedom with which each department manages its affairs and projects its work, evidences an especially conspicuous trait of Mr. Pennington—that of constantly endeavoring to encourage initiative in the organization, and to develop responsibility on the part of the officers. He has fitted well into the period of expansion from which the lines under his jurisdiction are emerging and as a result of his administration the organization is in good condition to enter the period of more intensive development.

The career of Mr. Pennington affords another instance of a man working his way up through the ranks and bears further evidence of the continuing opportunities in this country for success and achievement by young men of purpose and application. He was born in LaSalle, Ill., on September 16, 1848, and began his railway career in his twenty-first year as a warehouse man in the employ of the Chicago, Milwaukee & St. Paul. A year later he became a brakeman in the train service of that road. Two years later he was promoted to conductor and then in 1875, after rounding out five years in train service, he was appointed a roadmaster. He held this position until 1877, when he was promoted to superintendent of construction, a position from which he rose in 1879 to that of general roadmaster. After three years as general roadmaster, he was promoted to assistant superintendent on the Iowa & Dakota divisions and finally after 15 years of continuous service with the Chicago, Milwaukee & St. Paul, he resigned in 1884 to become a superintendent on the Minneapolis & Pacific. His connection with the Minneapolis, St. Paul & Sault Ste. Marie dates from the consolidation of the Minneapolis & Pacific with that road at the time of its reorganization in 1888, since which he served as superintendent until April 15, 1898; as general superintendent from April 15, 1898, to February 1, 1899; as general manager from February 1, 1899, to July 31, 1905; and as vice-president and general manager from July 31, 1905, to March 11, 1909, when he was elected president. Since that time, in addition to serving as president of the Minneapolis, St. Paul & Sault Ste. Marie, he has also acted as president of the Wisconsin Central; the Central Terminal Company; the Duluth, South Shore & Atlantic, the Mineral Range and the Spokane International.

The career of Mr. Pennington thus represents a continuous record of 52 years in railway service, of which over 35 years were spent with the Minneapolis, St. Paul & Sault Ste. Marie and 11 years as its president. As indicating the continuity with which he has applied himself to railway work, the statement is made, that for 35 years, with the exception of a week of sickness, and trips away on business, he has been in his office every day including Sundays.

George R. Huntington

As Mr. Pennington's successor, George R. Huntington enters upon his new duties with a long period of responsible

experience to his own credit, and in the estimation of his former chief, a thorough knowledge of the property of which he assumes control, coupled with ability that make him qualified to carry the administration through a trying period in its history.

In common with other roads in the vicinity, the Soo Line is suffering acutely from the business depression. The states traversed by its lines have experienced a series of crop failures which has greatly reduced the shipment of agricultural products outbound and by reducing the purchasing power of the farmers has similarly curtailed the shipment of agricultural implements and other products inbound. At the same time the shut-down of building throughout the country has reduced the shipment of lumber on the Pacific Coast. This resulted in the road earning a deficit of approximately three and a half million dollars in 1921. That the road will come back with the resumption of business is certain. That the problem at the present is trying and will tax the ability of the new executive is equally evident.

Mr. Huntington was born at New Lisbon, Wis., September 10, 1868, and entered railway service in 1882 as an office boy in the employ, as in the case of Mr. Pennington, of the Chicago, Milwaukee & St. Paul. Consecutively from 1882 to 1884 he was an office boy, an operator, and an agent on this road until 1884, when he was promoted to train dispatcher.

He entered the service of the Minneapolis, St. Paul & Sault Ste. Marie in 1888 as train dispatcher and served in that capacity until June 25, 1899, when he was promoted to superintendent. He was promoted to general superintendent on November 1, 1900, and in July of the following year was made general manager, with jurisdiction over the Minneapolis, St. Paul & Sault Ste. Marie and the Wisconsin Central (of which control had just been acquired). Mr. Huntington then continued as general manager of these properties until the roads passed into the hands of the government during the war, when he was made federal manager of the Minneapolis, St. Paul & Sault Ste. Marie; the Duluth, South Shore & Atlantic; the Mineral Range; the Copper Range and the Lake Superior Terminal & Transfer Company, in which capacity he continued until their return to their owners in 1920, when he became general manager of the Minneapolis, St. Paul & Sault Ste. Marie; the Duluth, South Shore & Atlantic, and the Mineral Range.

On March 10, 1920, he was also elected a vice-president of the Minneapolis, St. Paul & Sault Ste. Marie (including the Wisconsin Central) and the Duluth, South Shore & Atlantic, and continued as vice-president and general manager of these roads and general manager of the Mineral Range Railroad until the date of his recent election as president, May 16. Mr. Huntington thus enters the office of president at the age of 54, after a continuous career of 40 years in railway service, of which 23 years have been spent in the employ of the Minneapolis, St. Paul & Sault Ste. Marie and all of which has been spent in the northwest, where he has acquired a wide acquaintance among railway men and the shipping public.

THE BALTIMORE & OHIO RAILROAD ACCOUNTING ASSOCIATION has been organized at the general offices of that road in Baltimore, Md., and it is proposed to hold meetings regularly on the third Friday of every month. The object is to exchange views on railroad accounting problems and in general to promote inter-departmental co-operation. The membership is confined to the officers, chief clerks, head clerks and secretaries in the accounting, treasury, claims and relief departments, all of which are under Vice-president George M. Shriver. The membership of the association numbers already about 100. The principal speaker at the first meeting was John J. Ekin, comptroller. The president of the association is F. F. Lollman, and the secretary J. M. Finn.

C. & N.W. Revenue Tons Decreased 34.92 Per Cent

Loss for Year 1921 Totals \$10,070,708 After Dividends on Preferred and Common Stock

THE CHICAGO & NORTH WESTERN pays seven per cent on its preferred stock and five per cent on its common stock. These dividends totaled in 1921, \$8,825,275. The property had for the year a net loss after fixed charges of \$1,245,433, or, after the payment of dividends, a balance for the year in red of \$10,070,708. The reason for this is explained in a reduction in revenue tonnage of 34.92 per cent. The North Western reported for 1921 a revenue tonnage of 39,227,758 as compared with 60,275,207 in 1920.

The road's tonnage in 1921 was divided as follows: Products of agriculture, 19.80 per cent; products of animals, 5.59 per cent; products of mines, 37.57 per cent; products of forests, 13.48 per cent, and manufactures and miscellaneous, 18.42 per cent. The most decisive decrease in 1921 as compared with 1920 was in products of mines. The 1920 tonnage in this group was 29,731,546, or 49.33 per cent of the total tonnage; in 1920 this tonnage was reduced to 14,737,114—a reduction of 50.43 per cent. The tonnage of bituminous coal in 1920 was 10,254,478; in 1921 it was 6,235,916, or 39.19 per cent less. Bituminous coal in 1921 made up 15.9 per cent of the total tonnage. Iron ore showed a reduction of 74.19 per cent; whereas in 1920 it made up 13,978,103 tons or 23.19 per cent of the year's total tonnage, in 1921 it made up only 3,607,582 tons or 9.2 per cent of the total. The decrease in iron ore was also reflected under manufactures and miscellaneous in pig iron and steel products. Pig iron showed a reduction of 71.55 per cent; bar and sheet iron, etc., a reduction of 68.85 per cent. Practically the only commodities in which increases were shown as between the two years, were wheat, corn, packing house products, wool, etc., but with the exception of corn none of these represent a very considerable proportion of the North Western's total tonnage.

Taking the situation as a whole and noting particularly the degree of the reductions above noted, it was to have been expected that the North Western's results for the year would have been far from satisfactory. Because of the fact that the greatest reductions were in the classes of tonnage which load most heavily and are handled at the lowest costs per ton, it is also to be expected that the conditions mentioned should be reflected in the operating statistics, notably in the manner of decreased train load, or car load, etc.

"Due to the reductions in traffic handled," says the annual report, "substantial results in operating costs were effected, but it was impossible to reduce the operating costs in proportion to the loss in traffic. The total loss in tonnage was 34.92 per cent. Freight train miles were reduced 15.73 per cent; freight switching locomotive miles were reduced 25.45 per cent; loaded car miles were reduced 20.92 per cent; while empty freight car miles were reduced less than one per cent." The revenue train load in 1921 was 383 tons as compared with 458 in 1920. The revenue car load was 24.16 as compared with 26.31 in 1920.

The freight revenues of the North Western in 1921 totaled \$95,687,013 as compared with \$110,500,758 in 1920, a decrease of \$14,813,745. The passenger revenues for 1921 were \$33,770,082, a decrease of \$3,616,521. Total operating revenues were \$144,775,476 as against \$165,692,399 in 1920. There was, in other words, a reduction of \$20,916,924. The decrease in operating expenses was \$28,018,772. For 1921 the operating expenses totaled \$129,091,428 as compared with \$157,110,200 in 1920. The North Western operated at a ratio of 89.17 in 1921; in 1920, at 94.82. The decrease in operating expenses in 1921 as compared with 1920, in-

cluded decreases of \$6,974,044 in maintenance of way; of \$6,055,533 in maintenance of equipment, and of \$14,620,231 in transportation. With reference to maintenance of way, it should be noted that there were 126 miles of track renewed with new rail in 1921 as compared with 253 in 1920; 2,667,562 ties were put in as compared with 2,543,892 ties in 1920. The equipment condition is best indicated by a percentage of bad order cars on April 15 of but 7.6 per cent as compared with the country's average on that date of 13.9 per cent, this showing for the North Western a very favorable condition.

With further reference to expenses, it should be noted that the corporate income account includes a debit item under rental income of \$324,993. This is due to a charge to rentals of \$957,824, representing the cost of replacing the grain elevator at Chicago which suffered from an explosion on March 19, 1921. "At the time of the explosion," the report says, "approximately 7,000,000 bushels were in the elevator. As soon as the operators were able to remove this grain, the work of reconstruction was begun and it has progressed at favorable speed, and the elevator will be in shape to receive grain this season."

Acquisitions of Equipment

It has been suggested that the railway annual reports might well include in their pages some reference as to what the railroad is doing in the way of acquiring more equipment, etc. This is done in the Chicago & North Western report and the number of cars and locomotives mentioned is rather imposing. The North Western was allocated by the Railroad Administration 2,250 box cars and 1,000 gondola cars and 35 six-wheel switching locomotives. In 1920 it placed orders for 500 ore, 500 stock, 250 refrigerator and 50 caboose cars, for 62 passenger cars and for 40 Mikado and 20 Pacific type locomotives. It has since placed orders for additional passenger equipment totaling 50 cars to be delivered before June 30, 1922. In the *Railway Age* of May 6 it was further reported as having placed orders with the American Locomotive Company for 20 Mikado, 20 six-wheel switching and 10 Pacific type locomotives and in the *Railway Age* of April 29, as having placed orders with various car builders for 1,250 box, 500 flat, 500 stock, 250 gondola, 250 refrigerator and 300 ballast cars.

In 1921 the North Western resumed work on its grade separation work at Clinton, Iowa. It completed an 840-ft. extension to its ore dock at Ashland, Wis., several important bridges were constructed, etc., all of which indicate that although 1921 was a very poor year, the road did make some progress.

The North Western is another of those roads which was severely hit by federal control and it has not yet made considerable progress towards recovery. The road had a standard return or compensation for operation by the government of about \$23,000,000, of which in 1918 and 1919, it earned only about one-half. In 1920, when it had standard return for two months and guaranty for six, it had a deficit after rentals of \$1,609,232. In 1921 it earned a net after rentals of \$6,651,137. For the first three months of 1922 it had a net after rentals of \$1,712,169 as against a deficit for the first three months of 1921 of \$1,261,337, which indicates improvement, although not in great degree. Its loadings at present are running slightly ahead of those at this time last year, but the evidence on the whole is that the revival in business which is beginning to show itself has not yet

reached the North Western to the extent the road needs to give it a reasonably good year for 1922. There is but little question, however, but that it will be prepared to handle the business when it does come.

C., St. P., M. & O. Also Shows Deficit

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA is in much the same position as its parent company, the Chicago & North Western, which controls it through majority stock ownership. The Omaha is paying seven per cent on its preferred stock and five per cent on its common stock. The dividends on these issues totaled in 1921, \$1,715,986. The company had a net loss after fixed charges for the year of \$285,677 and a loss after dividends of \$2,001,663. This compared with a profit after dividends in 1920, in which year the road had poorer operating results than in 1921, which, however, were compensated for by standard return and guaranty.

The North Western owns \$5,380,000 of the \$11,259,859 outstanding Omaha preferred stock and \$9,540,000 of its \$18,559,087 common. The total dividend income of the parent company in 1921 was \$2,577,208, of which about one-third was derived from its Omaha shares. The Omaha in 1921 did not have as sharp a reduction in its traffic as the parent company. Its tonnage was reduced 21.85 per cent as against the North Western's 34.92 per cent. The reason for the lesser reduction was that the Omaha does not have a large tonnage of coal, iron ore and products of iron, in which classes of tonnage the North Western had its greatest reductions.

The Omaha is more of a granger road. This is shown by the fact that in 1921 products of agriculture made up 37.05 per cent of its total tonnage, whereas coal constituted only 8.95 per cent of the total tonnage; products of mines, as a whole, only 16.62 per cent, and manufactures and miscellaneous, only 17.44 per cent. The reductions in the Omaha's tonnage in 1921 as compared with 1920 were general. There was an increase in corn, however, of 67.58 per cent. Corn with a total movement in 1921 of 639,505 tons, made up 7.36 per cent of the total tonnage. The wheat moved totaled 730,631 tons, or 8.41 per cent of the total and was 10.69 per cent less than in 1920.

The revenue tons carried by the Omaha in 1921 totaled 8,691,370 as compared with 11,121,752 in 1920, a reduction, as above noted, of 21.85 per cent. The revenue ton-miles totaled 1,345,870,353, a decrease of 24.45 per cent, the greater proportionate decrease being due to a reduction in the average haul from 160.18 to 154.85 miles. The 1921 freight revenues totaled \$19,285,657, a decrease from 1920 of \$1,573,222. The passenger revenues of \$6,865,280 represented a reduction of \$1,433,347. The total operating revenues in 1921 were \$28,137,408 as compared with \$31,955,612 in 1920, this being a reduction of \$3,818,205. Operating expenses were reduced \$4,042,194. The 1921 total was \$24,392,314; the 1920, \$28,434,508. The operating ratio in 1921 was 86.69; in 1920, 88.98 per cent.

The Omaha's net after rentals in 1921 was \$2,065,349. This was slightly better than the figure for 1920, but not as good as in 1918 and 1919, when the road was being operated by the government. The 1918 and 1919 net after rentals further was only slightly over one-half the standard return which was fixed at about \$5,000,000. In view of the fact that the 1921 figure was only \$2,065,349, this means that the Omaha, like its parent company, the North Western, is thus far making but small progress in its return towards normalcy. The Omaha is doing slightly better proportionately. In 1920 it did not operate with a deficit after rentals as the parent company did and in 1921 it did not suffer as severe a falling off in its tonnage.

The Omaha's present position is quite like that of the North Western. It also has been making rather disappointing progress in restoring itself to its pre-war earnings standard. There has been some improvement shown in its condition thus far in 1922. In March it had a net after rentals of \$274,192 and for the three months, a net of \$259,297. This compared with a deficit in the first three months of 1921 of \$264,268. In the first three months of 1922 the operating ratio was 88.4, so the nature of the improvement over last year's first three months' figure cannot be termed peculiarly striking.

New York Central Authorized to Acquire Chicago Junction

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION, on May 18 made public its report authorizing the acquisition by the New York Central of control of the Chicago River & Indiana by the purchase of its capital stock for \$750,000 and the acquisition by the Chicago River & Indiana of control of the Chicago Junction by lease at a rental of \$2,000,000 a year, subject to 17 conditions. This proceeding has been pending since December 28, 1920. The application of the New York Central was opposed by eight trunk line roads entering Chicago from the east and southeast and by a group of Chicago shippers and the Chicago Railway Terminal Commission. Another group of shippers took a neutral position and in addition there were filed separate written endorsements of individual corporations and firms comprising about 90 per cent of the 400 shippers served by the Junction and the River road urging the commission's approval of the proposed plan. About 30 of these were subsequently withdrawn. Four of the commissioners, Commissioners Meyer, Aitchison, Eastman and Cox, signed dissenting opinions, while Commissioners Daniels, Campbell and Hall filed separate concurring opinions.

In support of its application, the New York Central showed that the New York Central lines are in need of downtown terminals in Chicago which they cannot now build up for themselves and that to bring under a common control the properties of the Junction and River roads and the Indiana Harbor Belt would greatly promote the public interest by providing the necessary balance between the inner industrial movement afforded by the former and the transfer, interchange and classification facilities available and potential on the rails of the latter. The territory served by the two roads is entirely within the Chicago switching district and besides serving the central manufacturing district and the stock yards district, the two roads handle traffic to and from all of the 23 trunk lines entering Chicago.

The intervening carriers contended that the plan was contrary to public interest because the two roads are now neutral and open to all carriers and shippers on equal terms and that the plan would substitute monopoly of these facilities for the present neutrality of operation. They took the position that they had an equity in the properties by reason of having contributed to the Junction's earnings by the absorption of switching charges and they offered to combine with the Central in a joint control of the properties on the basis of their fair value.

The shippers intervening in opposition expressed the belief that they would not under the proposed plan continue to enjoy existing routing privileges or receive equal service from all trunk lines entering Chicago, but would be forced to route over the Central as a matter of self-preservation. The second group of shippers desired to preserve the present organization of the Junction and the same impartial service

which they now enjoy and that the Central bind itself to accept certain conditions designed to insure that result. The Chicago Railway Terminal Commission feared that the project might prove deterrent to the adoption of the city's plan, not yet formulated, for the unification and co-ordination of all Chicago terminals.

Questions were also raised at the hearing as to the value of the properties. The Central offered proofs tending to show that the present cost of reproduction of the River road exceeds \$3,000,000 and a present cost of reproduction for the Junction properties, including the value of its leases, of considerable more than \$33,000,000. The commission's Bureau of Valuation has not yet completed its tentative report on these properties. The majority report of the commission says in part:

The Commission's Majority Report

Under all the circumstances it is not feasible to make a definite finding of value in this proceeding which shall be taken and accepted as a final judgment in the matter, and the conclusion herein reached renders such a finding unnecessary.

On all the facts of record, it is concluded that for the purpose of this proceeding only, we may accept the position of the Central that the market value of the properties to the Central and its affiliated companies at this time is such as to justify the payment of a rental based on something more than the value for capitalization or rate making purpose. That is by no means saying, however, that its figures are to be accepted as the basis for permanent capitalization or for rate making, or that the Central is to be permitted to capitalize the intangible values by paying, through the River road, permanent fixed charges on the basis of the market value claimed. Since the values are not at this time capable of definite settlement, it follows that such part of the application as relates to the purchase of the capital stock or the physical properties of the Junction will not be granted herein, but will be reserved for future treatment at such time as the Central may desire to renew its application in that respect, following the final determination of values under section 19a of the act.

There are grave objections to an unconditional approval of the plan under consideration. Much testimony was adduced at the hearings, and divergent opinions were expressed, as to the relative merits of cooperative, singly controlled and independently controlled terminals. That discussion need not be reproduced here. The policies and plans of the city with respect to the general terminal situation have not yet fully developed, and it is obviously impossible for any one to determine at this time the ultimate goal which ought to be attained. It is believed, however, that pending final determination of future policies, the greatest good can be attained by the continuance, for the time being, of the competitive terminal situation. This can be best accomplished by bringing the present neutral Junction properties into closer relation with a trunk line like the Central. The Central's terminal facilities are relatively inadequate as compared with the competitor eastern trunk lines, but the Central controls extensive facilities for classification and interchange which are complementary to the Junction properties. The stronger competition and the connection between the Junction properties and the Harbor Belt facilities which would thus be brought about, would not only insure to the shippers of the Junction the necessary expansion and elasticity of facilities, together with the assistance of an interested trunk line in times of car shortage, and other emergencies, but would also remove congestion from the closely hemmed-in district served by the Junction and thus open facilities for expedition in the handling of traffic in and out, and also for handling traffic from one part of the city to another. It has been held that where such a transaction as the present one would clearly facilitate the movement of traffic through a highly congested district, the circumstances that other carriers would suffer a loss of revenue is not controlling.

There are in the record ample grounds for the belief that the Junction can no longer solve its problems without outside assistance. On the other hand, it is believed that the benefits pointed out by the Central can be made to accrue to the public by the consummation of the proposed plan. A prime factor in the situation is the circumstance that the general policy on all terminals in Chicago is that of equal opportunity afforded to all connecting carriers irrespective of the ownership or control of a given terminal property by a single trunk line or by a group of trunk lines. Traffic is handled for all carriers in the same way and on the same terms, so that a shipper on terminals owned by a single carrier has the utmost freedom in routing via competing lines and apparently receives the same measure of service whether his shipment moves over the lines of the owning carrier or those of a competitor. Those shippers who appeared in opposition express the fear that they will not be accorded like treatment by the Central. The

present management of the Central disclaimed any intention of making any changes in the method of handling competitive traffic or the general plan of operating the Junction properties, and those assurances may be taken at their face value, especially since the contrary policy would clearly be against the self interest of the Central, in that it would thereby lose the good will of the shipper. There is, of course, every indication that the Central will be able to build up its own line-haul traffic as the result of its connection with the management of the Junction, and it by no means follows that harm to the public may result from legitimate effort and initiative to that end.

Commission Sets 17 Conditions

But we are not prepared, in any event, to authorize the consummation of the plan without making assurance doubly sure by the imposition of certain conditions. Those conditions relate partly to the method of operation of the property and partly to the treatment of the transaction by the corporations participating therein. Among the number are those matters enumerated by the shippers who have asked an approval of the plan with the understanding that certain agreements already made by the Central will be adhered to. Other matters are suggested by the group of shippers who took a neutral attitude at the hearing, such matters being agreed to on the record by the applicant; and still others suggest themselves from the standpoint of an administrative body, as necessary in order to safeguard the public interest in the future. Stated concretely, they are:

1. The Central will be required to maintain a separate corporate identity and organization for the combined properties of the Junction and River Road so that the two shall constitute a separate operating entity with a responsible management located in Chicago in order to preserve for the shipper the present direct access to the railroad officials.
2. The present neutrality of handling traffic in and outbound by the Junction and River Road organization shall be continued so as to permit equal opportunity for service to and from all trunk lines reaching Junction rails, without discrimination as to routing or movement of traffic which is competitive with the traffic of the Central, and without discrimination against such competitive traffic in the arrangement of schedules.
3. The present traffic and operating relationships existing between the Junction and River Road and all carriers operating in Chicago shall be continued, in so far as such matters are within the control of the Central.
4. For the purpose of assessment of switching charges, the Junction and River Road shall continue to be treated as a single line to the same extent as at present, so that the carrying out of this plan will not in and of itself result in increasing the charge to any shipper for the service.
5. Subject to subsisting car service regulations, cars made empty on the rails of the Junction and River Road shall be available for outbound loading in the same manner and to the same extent as at present, irrespective of routing.
6. Whenever additional cars are required for outbound loading, because of inadequacy of available car supply on the Junction and River Road rails at any given time, for any cause, orders for such additional cars shall be accepted from the shipper by the local Junction organization and by it promptly transmitted to the designated trunk line without discrimination, and all cars ordered by and delivered to the Junction shall be promptly moved to the shippers by the Junction without discrimination on account of proposed routing.
7. The Junction shall accept, handle and deliver all cars in and outbound, loaded and empty, without discrimination in promptness or frequency of service as between cars destined to or received from competing carriers and irrespective of destination or route of movement.
8. The National Code of Demurrage Rules, as in effect from time to time, including the average agreement, shall be applied by the Junction and River Road to each industry served by either of them on all in and outbound cars irrespective of what carrier or carriers may be interested in the line-haul.
9. Shippers served by the Junction and River Road shall be entitled to the same basis of switching charges as prevails in the Chicago switching district generally, and no attempt shall be made to establish any different basis of local or connecting line switching charges than that which prevails in the Chicago switching district generally for the same or similar service under substantially similar conditions.
10. No change shall be sought in the present method of basing rates to and from the Chicago switching district as a single point upon which rates are now based without regard to the character of the movement in and out of such district.
11. Present trap car arrangements for the transfer of l. c. l. freight at the Junction union station, at connecting line freight stations, or at connecting points reached by the Junction and River Road, shall be continued, but this condition shall not apply

to routine changes in management and operation of trap car service.

12. Continuance of present operating arrangement on the Junction properties shall include the maintenance of existing shipping and billing arrangements at the Junction union freight station, in so far as such arrangements are within the control of the Junction.

13. The Junction shall, if ordered by us, establish station facilities for the receipt of inbound l. c. l. freight at a point convenient and accessible to shippers wishing to make use of the same, to which freight may be delivered by all trunk line carriers, without discrimination, and there distributed through the medium of the Junction's operating force.

14. Neither the approval of the purchase by the Central of the stock of the River Road for the sum specified, nor of the leasing to the latter of the properties of the Junction, shall be taken as establishing or tending to establish the fair value of the respective properties in any other proceeding, nor shall anything herein contained be construed as a finding that the annual rental to be paid by the River Road for the lease of the Junction properties is just and reasonable.

15. The carrying out of the plan as authorized herein shall be taken to be without prejudice to the adoption of any plan or plans in the future by the city of Chicago, by us or by any other public agency, for unified or coordinated terminals, and neither the Central, the River Road nor the Junction shall urge the authority herein given or the situation resulting therefrom as a ground for opposition to such plan or plans of said city, our plans or those of any other public agency.

16. Nothing contained in this authorization shall be taken as permitting the River Road and Junction properties to be considered as a part of a single system with that of the Central for

any of the purposes of section 15a or section 20a of the act.

17. Any party or any person having an interest in the subject matter may at any future time make application for such modification of the above conditions, or any of them, as may be required in the public interest, and jurisdiction is retained to reopen the proceeding on our own motion for the same purpose.

Subject to the observance of the above conditions, we find that the acquisition by the Central of the capital stock of the River Road and the leasing to the River Road of the properties (owned and leased) of the Junction will be in the public interest.

Original Conditions Numbered 18

The commission at one time served a tentative report stating 17 conditions which should be imposed, most of which presented conditions which were assented to by the New York Central, although it objected somewhat to an additional order. Later a revised tentative report was served imposing 18 conditions. The New York Central objected in principle to the 17 conditions, but it objected particularly to Condition 18, which provided that the commission's order authorizing the transaction might at any time be cancelled for good cause shown, and this has been omitted.

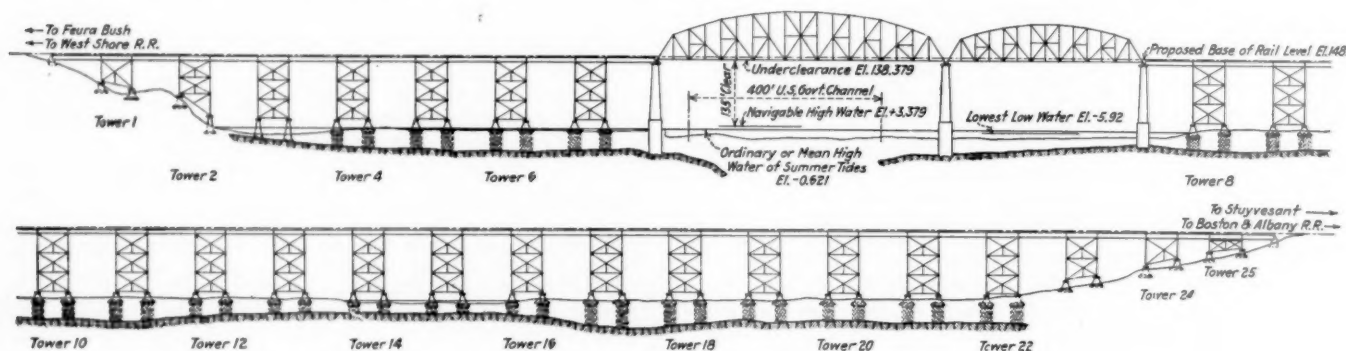
Commissioners Daniels and Campbell held that a certificate of public convenience and necessity should have been incorporated in the order entered and Commissioner Hall said that the facts warrant grant authority without elaboration of conditions.

Castleton Bridge and Freight Cut-Off Started

New York Central Commences \$20,000,000 Project to Relieve Operating Difficulties at Albany, N. Y.

CONSTRUCTION WORK will commence at once on the Castleton bridge and cut-off improvement of the New York Central, under plans providing for rapid work on a scale that will bring it into operation within two years. The bridge, connecting tracks, yards, etc., call for an ultimate expenditure of approximately \$20,000,000. The new bridge, located about 12 miles south of Albany, N. Y., near

amount of through freight traffic of New England and New York now passing through the Albany gateway, where conditions restrict rail facilities, causing uneconomical operation and in times of heavy business serious congestion and delays. In normal past years there has been an average interchange of 1,000 freight cars each way between the west and the Boston & Albany every day, and a daily interchange of 600



Plan of the Castleton Bridge

Schodack Landing, will be the second high-level structure to span the Hudson River, and larger than its single predecessor at Poughkeepsie, N. Y. Extending from it will be three tangents of double-track line, aggregating 20 miles, creating shorter and level connections between the main line of the New York Central and the Boston & Albany and the West Shore Railroad. The beneficial results forecasted include a great increase in passenger carrying and freight tonnage capacity and a possible substantial reduction of average time in transit of freight between the North Atlantic seaports and the Middle West.

The new connection will provide easy flow for a vast

cars with the Hudson River division of the New York Central, all of which must be moved through at Albany every 24 hours.

Operating Difficulties at Albany Will Be Obviated

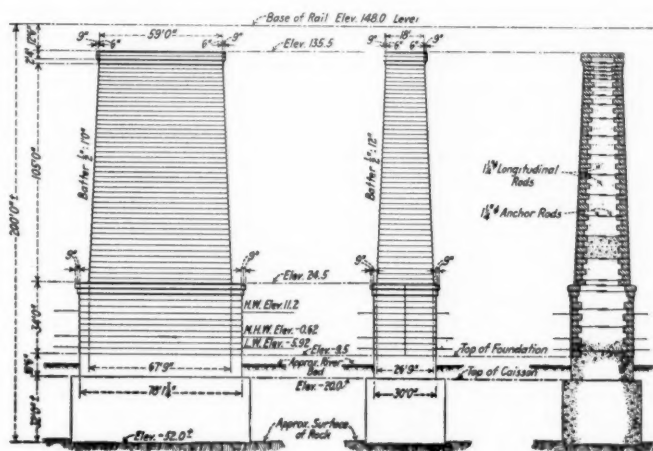
The Albany gateway of the New York Central is comparable to a "small neck of a large bottle." The major accomplishment of the Castleton improvement is relief from the obstacles to easy movement of heavy freight trains existing at Albany. The railroad has been able to handle efficiently no more tonnage than could be accommodated by the low drawbridges, and particularly the heavy grade west-

ward from West Albany to Karner, N. Y. Here for eight miles to the west is the steepest grade on the entire system.

Under present operating conditions freight trains of 80 cars can be brought solid from New York City for 140 miles on the water-level route along the Hudson, but before crossing the low drawbridge at Albany they have to be cut into sections, and each section supplied with a "pusher" for the long up-grade westward to Karner. All of the sections have been subject to various delays, often being held up by an open drawbridge in navigation season, while the reassembling of the sections has involved an additional expenditure of time and labor. During the busy navigation season the Albany drawbridges are turned 40 times a day.

A High Level Bridge With 138 Feet Clearance

The preliminary studies for the bridge involved extensive investigations and tests to find solid rock foundations beneath the river at locations where the currents and shore line topography were adaptable and land available. This required investigation of the river bed and banks over a



Elevation, End View and Section of Center Pier

great distance. At the Castleton location the three main supporting piers of the bridge, each 200 ft. in height, will be carried down below the river bed to a depth of 40 ft., 50 ft. and 70 ft., respectively, to solid rock. They will be faced with granite and limestone.

The structure across the Hudson will consist of two steel truss spans, 600 ft. and 400 ft. in length, flanked by steel viaducts on either side, the total length of the structure being approximately one mile. It will be built to carry two tracks but provision has been made in the design for expansion to four tracks when desired. The supporting piers for the main spans are three in number and, as stated, are 200 ft. high from base to bridge seat. This gives an under clearance of 138 ft. above high water level, slightly greater than the clearances of the high level bridge at Poughkeepsie, N. Y., or at the suspension bridges across East river at New York City. The tracks will be 150 ft. above the water line. The viaduct approaches to the main spans will be supported by rectangular steel towers, 25 in number, each carried on four concrete piers on piles driven to rock. Towers, center to center, are 164 ft. apart, the supports being in the form of a square, 64 ft. on a side.

At present the single existing navigable channel at the bridge site is 400 ft. wide between the government dikes, and as this will be blockaded during part of the construction work, the railroad will be compelled to dredge a second channel for a distance of over two miles, this to be a permanent and straighter channel, and run beneath the secondary span to permit flow of navigation without any interruption.

The routing of the 20 miles of rail connections involves the crossing of highways at 24 points, 16 on the east shore

and 8 on the west shore, but the construction is so arranged that at all of these places the tracks pass either above or below the roads without a single crossing at grade. To the west of the bridge the new trackage will extend inland across level farm lands for eight miles to a connection with the West Shore at Feura Bush, N. Y., where there will be constructed a large gravity freight classification yard. On the east shore the tracks will extend four miles with very slight grades to connection with the Boston & Albany at Van Hoesen, N. Y. The third lateral will make connection with the New York Central main line just north of Stuyvesant, N. Y., the new tracks skirting the bluffs for 12 miles southward from the bridge to accomplish easy grade. Maximum grades will be 0.35 per cent.

Double Track Rail Connections and

Classification Yard to Speed Up Movement

The improvement includes a large gravity freight classification yard with an over-all length of about six miles located at Feura Bush, where cars will be classified for movement eastbound and westbound. Eastbound classification will permit direct movement of solid trains over the West Shore tracks to Weehawken, N. J.; across the Castleton bridge to the New York Central main line and thence to terminals on Manhattan Island; and to connections with the Boston & Albany for deliveries in New England. In this yard may be concentrated the classification work now carried on in the smaller and inadequate yards at West Albany, Karner, Ravena and other points.

The yard comprises new engine terminal facilities with at least two enginehouses of 30 stalls, one of which will be built at the present time. The yard tracks will be arranged into tonnage and fast freight tracks each with its individual complement of receiving, classification and advance yards and winter and summer humps. About 60 per cent of the layout will be constructed immediately, as may be seen from the following typical items. The westbound receiving yard will have ultimately 24 tracks, each holding 45 to 100 cars of which 13 tracks with capacities of 50 to 90 cars, 1,000 car total, will be built at present. Westbound classification will have 32 tracks ultimately of which 28 tracks, 3,200 car capacity, will be built now, the corresponding yard eastbound to have ultimately 36 tracks and 28 at present.

All Legal Obstacles Now Removed

The Castleton cut-off was first definitely planned by the New York Central in 1910, and during succeeding years it has continuously been before public commissions, the courts or other authorities seeking the necessary official sanction. The opposition was launched and sustained throughout by residents of the City of Albany, the cut-off establishing a shorter new route between East and West that detours to the south of the city. The opposition to the bridge contended that if it were built in two spans the supporting pier in the middle of the river would constitute an obstruction to deep-draught shipping and also cause ice gorges and floods. The railroad contended that a bridge with a single 1,000-ft. span would cost a prohibitively higher sum, which was unnecessary, wasteful and impracticable from the railroad standpoint. All legal and legislative barriers have now been cleared away. A new act passed by Congress provides that the bridge and connections shall be completed and in operation by February 15, 1925, but the railroad's schedule calls for completion a year earlier.

The work is under the immediate direction of the engineering department of the New York Central, G. W. Kittredge, chief engineer; J. W. Pfau, engineer of construction; H. T. Welty, engineer of structures, and R. E. Dougherty, designing engineer. Contracts for the fabrication and delivery of the steel were let to the McClintic-Marshall Company, Pittsburgh, Pa., and for the grading and masonry to the Walsh Construction Co., Davenport, Iowa.

General News Department

The Interstate Commerce Commission has fixed June 15 as the date for the resumption of hearings at Washington on its tentative plan of consolidation as it applies to the Southeastern district.

Fewer Accidents—More Money

The board of trustees of the Brotherhood of Railroad Trainmen, because of the large decrease in the number of casualties to railroad employees, has recently recommended that members of the brotherhood be insured for \$2,700 at the rate heretofore paid for a \$2,000 policy; a 35 per cent increase in insurance without any additional cost.

Association of Railway Claim Agents

This association held its thirty-third annual convention at Montreal, Canada, on May 17, 18 and 19. The officers elected for the ensuing year are: President, R. H. Doolittle (C. & S.); first vice-president, W. H. Failing (C. of N. J.); second vice-president, S. R. Brittingham (S. A. L.); third vice-president, F. R. Haney (C. P. R.); secretary, H. D. Morris (N. P.).

New Line Chartered in Arkansas

The Arkansas state railroad incorporation board has granted a charter to the newly organized "Arkansas Short Line Railroad Company," which plans to operate a railroad between the town of Truman in Poinsett county and McDonald in Cross county, a distance of approximately 32.6 miles. The company is capitalized at \$200,000, all of which has been subscribed. The incorporators are the Poinsett Lumber & Manufacturing Company, which owns the controlling interest.

Southern Pacific Veterans' Reunion

The annual reunion and banquet of the Southern Pacific veterans was held in the Palace Hotel, San Francisco, Cal., on May 10, the 53rd anniversary of the driving of the last spike at Promontory Point, Utah, in 1869. A number of prominent pensioners were present from various points on the system. This company has pensioned 1,775 employees, of which 834 are living, and has paid out \$4,269,356 in pensions since the present pension policy was adopted in 1903.

Minnesota Car Repair Shed Law Declared Invalid

A statute passed by the Minnesota legislature requiring railroads and other concerns who build or repair cars and car trucks to provide shelters for the protection of workmen from inclement weather, was declared null and void in a decision rendered by Federal Judge W. F. Booth at Winona, Minn., on May 15. The decision grants the Chicago & North Western a permanent injunction restraining the Minnesota Railroad & Warehouse Commission and the attorney general of the state from enforcing the statute in question.

Our Regulating Machinery

There is more truth than jest in the assertion that about the only function left to railway management is the borrowing of money to make up deficits. There are ninety-nine agencies which make it a part of their duties to "regulate" the railways; 48 state legislatures, a like number of state commissions, Congress, the Railway Labor Board and the Interstate Commerce Commission. Most of these are not overlooking any opportunities to "regulate." Last year the legislatures of 42 states were in session. They passed 161 laws regulating railroads and having to do with railway affairs; and measures introduced but not enacted into law, numbered 411. Some of the 572 measures introduced were: To require railroads to fence the entire right of way; making it a felony to keep employees of a railway from holding public office;

prohibiting smoking on trains; prohibiting the use of paint-spraying machines; prohibiting advertising during threatened or actual strikes; prohibiting locomotives from running backwards; requiring all passenger trains to stop at all county seats; requiring railways having tracks along moving streams to keep the channels of such streams clear; requiring railways to transport all pupils in schools, high schools and night schools, at half fare.—*Central of Georgia Circular.*

U. S. Chamber of Commerce Opposes

Amendment of Commerce Act

The following resolution was adopted at the annual meeting of the Chamber of Commerce of the United States in Washington on May 18:

"The Transportation Act of 1920 placed in the interstate commerce law enactments which are of high importance, and which were advocated by the chamber. The interstate commerce act as it now stands should not be amended, and none of its basic provisions should be repealed, until there has been more opportunity for the law to be tested by experience under more normal conditions than yet exist. Opposition should be continued against proposals for the repeal of such basic provisions of the law as confer upon the Interstate Commerce Commission power to correct intrastate rates that unreasonably discriminate against interstate commerce, and give the commission the guidance of a rule for rate-making intended to secure for the public adequate transportation facilities and services."

Carl R. Gray, president of the Union Pacific, was elected a director of the chamber representing the transportation and communication department.

Pensions Capitalized

W. A. Winburn, president of the Central of Georgia, finding that employees do not fully understand and appreciate the benefit of being promised a pension on retirements from the service, has issued a letter briefly explaining the retirement plan and calling attention to what a pension costs the employer. He says, in part:

"The basis for pension allowance is one per cent for each year of service. . . . For example, an employee who had served continuously for 25 years, and whose average pay for the last ten years of service was \$200 a month, would receive 25 per cent of \$200 or \$50 a month; if in service 30 years he would receive \$60 a month. In other words, the company has set aside the sum of \$12,000 for the benefit of that 30-year employee and the interest at the rate of 6 per cent per annum on that sum, goes to the employee in the form of a pension. The man who earns more receives more and the man who earns less, has less; but every employee who complies with the requirements participates in the benefits.

"It should certainly be an incentive to faithful and continuous service to know that liberal provision is made for us.

We should regard the length and continuity of our service records with a pride second only to the pride in doing well whatever we have to do."

Manhattan Produce Yard

This is the name of a new freight delivery yard, with eleven team tracks holding 511 cars, which has just been completed by the Pennsylvania Railroad at South Kearney, near Meadows, N. J., five miles from the ferry terminus at Jersey City. The work has been done in five weeks at an expense of \$250,000, under the supervision of F. D. Davis, division engineer.

This yard is to be used for the delivery of perishable food-stuffs for distribution in New York City, and marks what may be considered the first step to provide facilities for the delivery of freight in conjunction with the proposed vehicular tunnel under

the North River connecting New York and New Jersey, the construction of which is expected to commence shortly. For the present consignees' trucks will have to cross the river by ferry. The new yard will assist materially in relieving the congestion at the piers on the New York side, which often results in hundreds of carloads of perishables missing the daily wholesale, produce markets and auctions, and makes it necessary to embargo much freight.

For the immediate present the new yard will be used only for the delivery of watermelons, of which, between now and September 1, the Pennsylvania expects about 3,500 carloads.

The yard covers 28 acres. There are five macadamized driveways for motor vehicles, averaging 2,000 ft. in length and 66 ft. wide. Each driveway is electrically illuminated with three lamps—1,000 watt—suspended 50 ft. in the air. The office building is 25 ft. by 60 ft.

Tentative Valuations

The Interstate Commerce Commission on May 22 announced a number of additional tentative valuations, including a report on the Virginian Railway as of June 30, 1916, in which it placed the final value of the property owned, including 470 miles of first main track and 657 miles of all track, at \$52,750,314 and of the property used, including 474 miles of first track and 697 miles of all track at \$55,862,622. The outstanding capitalization as of the valuation date was \$89,663,500, of which \$59,226,500 was stock and \$30,437,000 was funded debt. The investment in road and equipment, including land, as stated in the company's books was \$87,604,302. The report says that if readjusted this would be increased to \$87,683,906, of which \$77,487,693 consists of the par value of securities issued, the money value of which is not determined. The original cost was not ascertained but it is stated that the recorded money outlay did not exceed \$44,931,594. In addition the carrier issued \$7,387,693 par value of securities for common carrier property.

The cost of reproduction new of the owned property is given as \$49,497,678 and the cost less depreciation as \$43,513,419. The cost of reproduction new of the used property was given as \$51,779,449 and the cost less depreciation as \$45,456,204. The final value of the property of the Virginian Terminal Railway, whose stock is owned by the Virginian, was placed at \$2,670,000. The company has outstanding \$3,500,000 of stock and bonds.

The final value of the carrier property owned by the Central Vermont as of 1917 was placed at \$16,592,724 and of the used property at \$22,665,787. The capitalization was \$14,257,000 and the investment in road and equipment as shown by the carrier's books was \$16,997,915, readjusted by the commission to \$15,968,989. The final value of the Bethel Granite was placed at \$87,500 and of the New London Northern at \$5,281,892.

The commission has also issued other tentative valuations stating the final values as follows:

		Property Owned	Property Used
Fort Street Union Depot Co.....	1915	\$2,195,779	\$2,212,336
Carolina & Tennessee Southern	1915	377,077	.....
Oregon Trunk Line	1916	15,049,086	.....
Maryland, Delaware & Virginia	1915	2,266,312	2,696,312
Puget Sound & Cascade	1917	427,902	.....
Baltimore, Chesapeake & Atlantic	1915	3,217,309	3,567,309
Sharpsville Railroad	1916	364,194	389,493
Magma Arizona	1917	319,560	.....

Amendment of Transportation Act Opposed

Bruce Scott, general solicitor of the Chicago, Burlington & Quincy, testified on May 23 before the House Interstate and Foreign Commerce Committee that enactment of either the Sweet or Hoch bills would prove a misfortune to interstate commerce. Those measures propose a limitation on the so-called Shreveport doctrine and would bring about such an uncertainty in commerce as to hurt business at a time when every effort is being made to restore normalcy.

Under the Sweet bill, it is proposed to repeal section 15a of the Transportation Act while under both the Sweet and Hoch bills it is proposed to limit the jurisdiction of the Interstate Commerce Commission over intrastate rates.

These acts would start a new series of litigation on every hand for the purpose of construing the law and would unsettle business for years. Since the enactment of the law conditions have been abnormal so that the act has not been given an opportunity to prove its practicability. It has been argued that the states have been deprived of power over intrastate rates. The carriers have

never argued in support of such a contention. Before the Supreme Court they contended that the Interstate Commerce Commission had power over such rates only when they discriminated against interstate commerce; and the court upheld this contention.

Mr. Scott also said that 34 federal judges who have passed on the act have been unanimous in sustaining the interpretation of the act as given by the railroads and the Interstate Commerce Commission. The federal commission in administering the law recognized the national character of the transportation systems in its order making a general increase in freight rates on August 26, 1920.

Under the common law the carriers are entitled to a "fair return." It cannot be contended that a return of 6 per cent is excessive; yet the railroads in 1921 only earned 3½ per cent. The Interstate Commerce Commission in its decision in the hay and grain rate case held that freight rates were not responsible for the business depression. Experience has shown that reductions in rates have not stimulated traffic or buying.

Mr. Scott called attention to the fact that so far as his observation went no shipper had appeared before the committee in support of either bill but that support of the proposed legislation had come entirely from representatives of the state railroad commissions.

The Senate Committee on Interstate Commerce met on May 23 to consider its report on the Capper and other bills to amend the Transportation Act, but adjourned to meet later without taking definite action.

C. P. R. Memorial to Fallen Employees

Lord Byng, Governor-General of Canada, recently unveiled in the Windsor Street Station of the Canadian Pacific at Montreal a memorial to the 1,100 employees of that company who lost their lives in the war. The accompanying photograph portrays the unveiling ceremonies with Lord Byng speaking and E. W. Beatty,



Unveiling the Memorial

president of the company, standing at his right. The guard of honor was composed of employees who had been in the service. At the same time that this memorial was unveiled, similar ones were unveiled at Winnipeg and Vancouver. Likewise 25 bronze tablets were at the same time unveiled at various points along the C. P. R. as well as at the company's American, European and Asiatic offices.

Traffic News

A bill to repeal Section 15-a of the interstate commerce act and to restore the rates in effect prior to the increases of August 26, 1920, was introduced in the House by Representative Huddleston on May 22.

The Union Pacific will put on a new passenger train from Pocatello, Idaho, to West Yellowstone, Mont., on June 20, leaving Pocatello at 9 a. m. The operation of the "Yellowstone Special" from Salt Lake City, Utah, to West Yellowstone will be resumed. This train will carry a through sleeper from Chicago.

The Merchants' Association, New York City, announces that freight rates from New York to Chicago and Milwaukee, by Hudson river, the barge canal and lake vessels, have been reduced; the new tariff being on a basis of \$1.21½ first class; sixth class 40½ cents per 100 lb. and other rates in proportion. The first class rate is 36 cents less than the rate by all rail, and sixth class 12 cents less.

The Transportation Club of Evansville, Ind., was recently organized and it has a membership of 80. The officers are as follows: President, J. C. Keller, traffic commissioner of the Furniture Manufacturers' Association; vice-president, E. E. Wieland, general agent of the Chicago & Eastern Illinois; and secretary and treasurer, W. H. Orr, chief clerk in the general freight office of the Louisville & Nashville.

The Canadian Pacific has announced the inauguration of the "Empress Steamship Special," a solid vestibule passenger train operating between Chicago and its Empress steamship docks at Vancouver, B. C. The initial trip of the train will be made on June 12, and departures will thereafter continue to connect with each steamer for Yokohama, Hong Kong, and other oriental points, there being two such sailings each month. The same company has also resumed the operation of its "Trans-Canada Limited" which will run daily between Montreal, Toronto, and Vancouver. A through passenger train, to be known as the "Soo-Pacific Express" operating between Vancouver, Minneapolis, St. Paul and Chicago, will also be placed in service beginning June 4.

Coal Production

Having risen close to the 4,500,000-ton mark, the production of soft coal shows no further increase, according to the weekly bulletin of the Geological Survey. Production of anthracite remains practically zero.

The revised figures for the sixth week of the strike (May 8-13) indicate 4,421,000 tons of bituminous coal and 7,000 tons of anthracite. Up to the close of the sixth week the total output since the strike began was 23,826,000 tons of bituminous coal and 39,000 tons of anthracite, the anthracite mines were working to capacity and the 11,816,000 tons which they produced, added to 29,329,000 tons contributed by the bituminous mines which remained in operation, gave a total for the six weeks of 41,145,000 tons. Following is the condensed record:

	1st Week	4th Week	6th Week	7th Week
Monday	11,445	12,131	13,118	13,399
Tuesday	11,019	12,377	13,266	12,726
Wednesday	11,437	12,622	13,445	13,421
Thursday	11,090	12,981	13,266	13,283
Friday	11,296	12,362	13,727	.....
Saturday	8,888	11,295	11,454	.....

The record suggests no marked change in the number of men on strike. No further increase is reported in shipments out of Southeast Kentucky and Tennessee, the only district where any considerable number of striking union miners have gone back to work. The market has quickened, as is indicated by rising spot prices.

VETERANS of the Philadelphia & Reading, numbering, with their families, about 1,000, were taken by the company last Saturday, May 20, on an excursion to New York City and by steamboat up the Hudson River.

Commission and Court News

Interstate Commerce Commission

The commission has vacated its order relating to intrastate rates in Georgia, the railroad commission of that state having amended its order so as to approve increases similar to those ordered by the federal commission.

The commission has suspended until September 19 the operation of schedules which propose to reduce from \$1.35 per 100 lb. to 74½ cents the rates on sash and doors, from Pacific Coast points to New York, via Southern Pacific and Morgan Line.

The commission has suspended until September 21 the operation of schedules which propose for backhaul or out of line service on cars of grain, hay, straw and seeds for inspection and disposition orders, at points in Texas, an additional charge based on the extra mileage involved the same as those now applicable on shipments reconsigned or diverted.

The commission, on petition of the city of Detroit, has reopened the standard time zone case for further hearing upon the question of whether the orders of the commission, insofar as they define the boundary line between the standard Eastern time zone and the standard Central time zone, should be so modified as to include the city of Detroit, and any western portions of the state of Michigan. The hearing will be held at Detroit, May 29, before Commissioner Aitchison.

State Commissions

Protest Abandonment of Memphis D. & G.

On April 26 and 27 a hearing was held by the Arkansas Railroad Commission, at the request of the Interstate Commerce Commission, to consider the petition of the Memphis, Dallas & Gulf, for leave to take up its tracks between Nashville, Ark., and Hot Springs, 87 miles. Since that time the state body has been preparing a report; and this report says: "On May 5 we inspected the railroad from Hot Springs, Ark., to Murfreesboro, 72 miles, and found the roadbed in good condition, the line and curvature good, and the rails for the most part likewise in good operating condition. The territory adjacent is now being developed. There are numerous business enterprises, such as gins, stores, truck farms and sawmills, which at present are practically valueless on account of the railroad not being operated. The country traversed by this railroad is adapted to the growing of cotton and is rich in undeveloped mineral resources; and . . . in our opinion no part of the road should be abandoned as we feel that under normal conditions and times the road as a whole could be operated at a profit to its owners. . . ."

Court News

Highway on Railroad Right of Way

Where a railroad company has by act of Congress a 400-ft. right of way, the Kansas Supreme Court holds that the laying out of a parallel highway inside of its boundaries 50 ft. from the track does not extinguish the company's right to the strip on the farther side of the highway.—Union Pacific v. Heger (Kan.), 204 Pac. 1008.

Railroad Not Liable as Garnishee for Wages

Earned During Federal Control

A railroad company is not liable for wages earned by an employee, while he was employed by the Federal Railroad Administration in operating the company's properties, and such a railroad company cannot be required to respond as garnishee of funds from which such earnings are alleged to be due.—Heuermann v. Huermann (Missouri Pacific, Garnishee) (Mo. App.), 237 S. W. 893.

Foreign Railway News

Locomotive Exports in February

During February 39 steam locomotives were exported as follows: Eight to Honduras (\$62,575); one to Cuba (\$22,200); 19 to Argentina (\$856,100); five to Brazil (\$240,710); two to China (\$9,450), and four to Hongkong (\$78,130), giving a total value of \$1,269,165. These figures were compiled by the Bureau of Foreign and Domestic Commerce.

Car Exports in February

Only one passenger car, valued at \$1,000, was exported in February. This car went to Mexico. Forty-one freight cars were exported, valued at \$50,236, as follows: 12 to Mexico (\$10,686); 22 to Cuba (\$20,300); one to Dominican Republic (\$520); and six to Australia (\$18,730). These figures were compiled by the Bureau of Foreign and Domestic Commerce.

Belgian Firm Secures Finnish Contract

LONDON.

A contract has just been concluded between the Finnish State Railways and the Belgian firm, Société Anonyme des Acieries d'Angleur, for the delivery of 15,142 tons of rails. Tenders were received from Belgian, English, French and German firms, one firm in Luxemburg also competing. The Belgian tenders were lowest in price. The French, German and Luxemburgian firms were from 9.5 per cent to 16.7 per cent higher than the Belgian firm's quotations, and the English quotations were from 21 per cent to 44 per cent higher.

February Exports of Car Wheels and Axles

Car wheels and axles weighing 1,533,486 lb. and valued at \$64,700 were exported in February, according to the compilations of the Bureau of Foreign and Domestic Commerce. Detailed figures by countries follow:

Countries	Pounds	Countries	Pounds
Canada	154,182	Dominican Republic	2,359
Guatemala	1,658	Brazil	8,123
Honduras	16,781	Chile	33,597
Panama	24,008	Peru	9,509
Mexico	679,091	Venezuela	2,681
Barbados	42,800	British India	137,600
Trinidad and Tobago	19,936	Other Brit. East Indies	6,059
Cuba	15,943	New Zealand	1,938
Japan	231,838	British South Africa	1,014
Kwantung	49,905	Other countries	1,492
Philippines	50,000		
Australia	42,972	Total	1,533,486
		Value	\$64,700

Powerful Combine of British Supply Manufacturers

LONDON.

An interesting engineering combine has just been registered under the title of the Power & Transport Finance Company. The firms represented in the combine are Cammell, Laird & Co., Ltd., shipbuilders; Sir William Arrol & Co., Ltd., machinery manufacturers; the English Electric Company, Ltd., electrical manufacturers; John Brown & Co., Ltd., shipbuilders; the North British Locomotive Company, Ltd., locomotive builders; and the Prudential Assurance Company, Ltd. The board of directors consists of W. L. Hitchens of Cammell, Laird & Co., Sir John Hunter of Sir William Arrol & Co., Lord Meston and P. J. Pybus of the English Electric Co., Sir Hugh Reid of the North British Locomotive Co., John Sampson of John Brown & Co., and Sir George May of the Prudential Assurance Company. The object of the company is to undertake and, if necessary, to finance large contracts for railway construction, rolling stock, power stations, docks and harbors and, in general, all other aspects of power production and transport work. The new company has established headquarters in Kingsway, London, W. C. The initial capital is £250,000.

Track Material Exports in February

Rails exported in February were valued at \$508,460 and tonnage was 14,093. Exports of rail joints, splice bars, fish-plates and tie-plates were valued at \$48,508; of switches, frogs and crossings at \$54,567; of track spikes at \$27,756; and of bolts, nuts and washers at \$9,624. These figures were compiled by the Bureau of Foreign and Domestic Commerce. Details by countries follow:

Countries	Rails, Tons	Rail Joints, Splice Bars, Fish Plates and Tie Plates, Pounds	Switches, Frogs and Crossings, Pounds	Railroad Spikes Pounds	Railroad Bolts, Nuts, Washers, etc., Pounds
Spain	1,783	131,500	10,500	.....	615
Canada—Quebec and Ont.	1,970	79,005	122,059	1,000	39,081
Prairie Provinces	32	13,534	.....	6,000	1,210
Br. Columbia and Yukon	.....	22,029	29,553	49,200	9,246
Costa Rica	.....	.....	.....	29,000	1,530
Guatemala	.....	16,600	1,393	.....	2,000
Honduras	2,543	138,315	56,710	139,290	26,017
Mexico	306	63,548	191,979	188,401	29,950
Newfoundland and Labrador	.....	.....	.....	36,000	.....
Cuba	76	16,026	17,992	138,300	8,400
Dominican Republic	.....	2,932	.....	25,000	1,000
Haiti	8	4,786	.....	14,800	914
Brazil	552	.....	261,986	6,248	6,567
Chile	.....	2,430	968	4,000	382
Colombia	306	37,536	2,818	55,010	3,039
Peru	346	36,840	.....	.....	37,092
Venezuela	.....	.....	3,359	6,600	.....
British India	.....	63	11,060	.....	19,171
China	213	7,740	30,059	9,428	.....
Java and Madura	.....	164,760	.....	.....	.....
Other Dutch East Indies	.....	57,300	.....	.....	.....
Japan	5,050	488,863	.....	40,429	4,729
Philippine Islands	787	61,865	.....	106,580	10,535
New Zealand	66	.....	.....	.....	1,278
British South Africa	6	.....	20,545	.....	.....
Other countries	49	12,680	4,889	7,945	2,806
Total quantity	14,093	1,358,352	765,870	863,231	205,662
Total value	\$508,460	\$48,508	\$54,567	\$27,756	\$9,624

The Trans-Zambesia Railway

The recent completion of the Trans-Zambesia Railway from Beira, a seaport in Portuguese East Africa, northward to the Zambesia river opens up a vast area of rich natural resources. The Trans-Zambesia touches the river at Chindio. Northward from this point to Blantyre, in the Nyasaland Protectorate (about 100 miles south of Lake Nyasa), the Shiré Highlands Railway was already in operation. Bids have been asked, according to the Times (London) Trade Supplement, for the extension of the line to Lake Nyasa. When this is completed vast territories in South Central Africa will have direct connections with the sea.

Attention should be drawn to the fact that while the Shiré Highlands Railway is in British territory, the recently completed Trans-Zambesia is not. Instead it is in Portuguese territory. Notwithstanding this the Nyasaland government was so desirous of securing rail connections with the sea that it guaranteed the interest on the railways bonds for a period of 25 years and furthermore will retire half of them at its own expense within 20 years.

The Trans-Zambesia Railway was financed and built by a British company. A British contractor built the line for £810,000, including one important bridge and stations, culverts, telegraph lines, etc. Construction of the new railway was begun in September, 1920.

From Beira the new railway uses the line of the Beira-Mashonaland Railway to Dondo Junction, 18 miles from Beira. Thence it extends northward 157 miles (which is the extent of the new construction involved) to the Zambesia river. The ferry run across the river to Chindio is 2½ miles where the Shiré Highlands Railway begins. From Chindio to Blantyre is 173½ miles, making the total distance from Beira to Blantyre by rail and ferry 351 miles.

The gage of the line is 3 ft. 6 in., which is almost universal in Southern Africa, and 60 lb. rails were used. With the exception of one bridge of five 90-ft. spans there were no great natural obstacles to construction. It is planned eventually to carry the railway further up the Zambesia river where a bridge will be built, thus avoiding the ferry.

Little American equipment was purchased for the new line, the bulk of the orders going to British concerns, although the Pressed Steel Car Company was awarded contracts for a number of box cars, cattle cars and gondolas.

Equipment and Supplies

Locomotives

THE UNITED SUGAR COMPANIES of South America, Los Moches, Sinaloa, Mexico, has ordered one Mikado type locomotive from the Baldwin Locomotive Works.

THE NORFOLK SOUTHERN, reported in the *Railway Age* of May 8 as inquiring for 5 Consolidation type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

THE PEORIA & PEKIN UNION, reported in the *Railway Age* of May 6 as inquiring for six 6-wheel switching locomotives, has ordered this equipment from the Lima Locomotive Works.

THE CHICAGO & EASTERN ILLINOIS, reported in the *Railway Age* of May 20 as contemplating the purchase of 6 Pacific type locomotives, has sent out inquiries for the same. In addition to its inquiry for passenger locomotives this company is accepting bids for 10 Mikado type locomotives.

Freight Cars

THE KANSAS CITY SOUTHERN is inquiring for 1,000, 40-ton box cars.

THE BUREAU OF MINES will receive bids until May 31 for two mine rescue cars.

THE UNITED STATES ARMY is inquiring for a U. S. R. A. box car equipped with air compressor.

THE WABASH is reported to have ordered 750 car bodies from the Standard Steel Car Company.

THE BETHLEHEM CHILE IRON MINES COMPANY is inquiring for 25 hopper ore cars of 50-tons' capacity.

THE BELT RAILWAY OF CHICAGO has ordered 100 hopper cars from the Western Steel Car & Foundry Company.

THE BALTIMORE & OHIO is inquiring for 1,000 hopper car bodies of 50 tons' capacity and 500 box car bodies.

THE MISSOURI, KANSAS & TEXAS has ordered 200 refrigerator cars from the American Car & Foundry Company.

THE FORT SMITH & WESTERN has ordered 125 steel center constructions from the Western Steel Car & Foundry Company.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 100 steel center constructions from the Illinois Car & Manufacturing Company.

THE UNION REFRIGERATOR TRANSIT COMPANY, Milwaukee, Wis., has ordered 350 refrigerator cars from the American Car & Foundry Co.

THE SEABOARD AIR LINE is inquiring for 900 steel underframe, ventilated box cars of 40 tons' capacity also for 100 phosphate cars of 50 tons' capacity.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of April 29, as inquiring for 400 refrigerator cars, has ordered this equipment from the Merchants' Despatch.

THE CHILE EXPLORATION COMPANY, New York City, reported in the *Railway Age* of May 20 as inquiring for 50, 70-ton ore cars, has ordered 50 steel ore cars from the Pressed Steel Car Company.

THE CHICAGO, NORTH SHORE & MILWAUKEE, in addition to its order for 15 merchandise dispatch cars from the Cincinnati Car Company, reported in the *Railway Age* of May 13, has purchased one motor line car from the same company.

THE BALTIMORE & OHIO is having repairs made to 25 refrigerator cars at the shops of the Standard Steel Car Company and to 25 at the shops of the American Car & Foundry Co., and 25 coke cars at the shops of the Koppel Car Repair Co.

THE FLORIDA EAST COAST, reported in the *Railway Age* of April 8 as asking for prices on 400 refrigerator cars, has ordered 175 of these cars from the Mount Vernon Car Manufacturing Company. The company is asking for prices on 20 tank cars of 10,000-gal. capacity.

THE ERIE, reported in the *Railway Age* of May 6 as contemplating having repairs made to a large number of freight cars, is now having repairs made to 100 refrigerator cars at the shops of the Standard Steel Car Company and is asking for prices on the repair of about 3,000 cars.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of May 13 as inquiring for 2,000 steel-underframe, double-sheathed box cars of 40 tons' capacity, has ordered this equipment as follows: From the Pullman Company, 1,000 cars; from the American Car & Foundry Co., 500 cars; and from the Standard Steel Car Company, 500 cars.

Passenger Cars

THE SEABOARD AIR LINE, reported in the *Railway Age* of April 8 as inquiring for 5 dining cars, has ordered 10 dining cars from the Pullman Company.

THE MISSOURI, KANSAS & TEXAS, reported in the *Railway Age* of April 15 as inquiring for 30 passenger cars, has ordered 30 steel passenger coaches from the American Car & Foundry Co.

ST. LOUIS-SAN FRANCISCO, reported in the *Railway Age* of April 22 as inquiring for 6 chair cars and 8 coaches, has ordered 6 steel chair cars and 8 steel coaches from the American Car & Foundry Co.

Iron and Steel

THE INDIANAPOLIS UNION is inquiring for 500 tons of 85 lb. rails.

THE IMPERIAL GOVERNMENT RAILWAYS of Japan have ordered 10,000 tons of 60-lb. rail and 600 tons of accessories, through Mitsubishi Shoji Kaisha, Ltd., New York City, from the Consolidated Steel Corporation.

Machinery and Tools

THE WHEELING & LAKE ERIE has ordered one 48-in. car wheel borer from the Niles-Bement-Pond Company.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for a portable motor-driven bolt lathe with quick change gears and taper attachment. This same company is soon expected to distribute orders for its large outstanding machinery inquiry.

Signaling

THE LONG ISLAND has bought from the Union Switch & Signal Company a Saxby & Farmer interlocking machine, 12 levers, with connections and other material for installation at Jekyll Island, N. Y.; also an electro-pneumatic interlocking machine for Flatbush, N. Y., 31 working levers.

Miscellaneous

THE TEXAS & PACIFIC has ordered three 100-ton turntables from the American Bridge Company.

THE IMPERIAL GOVERNMENT RAILWAYS OF JAPAN are inquiring through New York City export houses for a large amount of air brake parts.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS will accept bids until June 2, for seven 90-lb. manganese frogs and 151 switch stands with accessories.

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon May 31, at Roanoke, Va., for 70 cast steel rigid side frames, 50 cast steel flexible side frames and 2,500 steel bulb angles.

Supply Trade News

O. H. Dallman, formerly with the Vanadium Alloy Steel Company, Latrobe, Pa., and the mechanical department of the Pennsylvania Railroad at its Fifty-fifth street shops, Chicago, has joined the sales force of the **Independent Pneumatic Tool Company**, Chicago.

Wesley W. Burden, formerly with the Bird-Archer Company as chief mechanical engineer and assistant to the president, has resigned to become vice-president and treasurer of the **Wilbur G. Hudson Corporation**, engineers and constructors, with offices at 50 Church street, New York. This company specializes in coal, coke, ash, and ore handling systems, steel, timber and reinforced concrete structures, railroad shops, roundhouses, terminals, and railroad coaling stations.

A. W. Bowie and **J. J. Lydon**, who have for the past 25 years been connected with Westinghouse, Church, Kerr & Company, and their successors, Dwight P. Robinson & Company, have recently resigned from that organization and have organized the firm of **Bowie, Lydon & Company, Inc.**, to handle railroad and industrial construction, with offices at 340 West Harrison street, Chicago. **W. G. Bierd**, president of the Chicago & Alton, has been elected president of this company and **M. P. Tilley**, formerly with Westinghouse, Church, Kerr & Company and more recently with the Lustbader Constitution Company, has been added to the staff.

Westinghouse Electric & Manufacturing Company

The gross earnings of the Westinghouse Electric & Manufacturing Company from sales billed for the year ended March 31, 1922, as shown by the company's annual report, were \$99,722,026, compared with \$150,980,106 in the previous fiscal year. The net income available for dividends was \$5,837,389, as against \$12,617,536 in 1921. Dividends on the common and preferred stocks last year totaled \$5,984,895. The surplus, as of March 31, 1922, was \$42,324,085.

Guy E. Tripp, chairman, in his report to the stockholders says: "The general business depression during the past year is reflected by the reduced volume of business, but an extreme depression in certain important departments reduced the net profits to a greater proportional extent than would be usual on the diminished amount of business.

"Due to the low volume of business taken during the year, the value of unfilled orders in hand has been reduced from \$65,621,000 as shown in last year's report, to \$50,740,696 as of March 31, 1922. The contraction in orders booked continued throughout the year until January, 1922, when there began a substantial improvement which has since been maintained. In addition to the favorable indications for an increasing demand for the regular lines of your company's product, a large demand for radio telephone receiving apparatus has recently developed with a prospect of its continuance for an indefinite period. It should be pointed out, however, that the ensuing year promised to be a period of keen competition."

The consolidated general balance sheet follows:

ASSETS	
Property and plant	\$47,942,797
Investments	17,029,221
Cash	9,966,631
United States bonds and Treasury notes	7,886,309
Cash on deposit for matured bonds, etc.	64,492
Notes receivable	5,660,841
Accounts receivable	18,146,790
Inventories	55,027,059
Other assets	5,345,746
Total	\$167,069,886
LIABILITIES	
Capital stock:	
Preferred	\$3,998,700
Common	70,813,950
Funded debt	36,249,000
Current liabilities	11,400,121
Reserves	2,384,030
Profit and loss—surplus	42,324,085
Total!	\$167,069,886

Railway Construction

BALTIMORE & OHIO.—This company has awarded a contract to the Ferro Construction Company, Chicago, for the erection of the steel superstructure of a bridge to be erected over Salt creek, east of Vigo, O. The new bridge is of two single-track, through-truss spans, each 144 ft. from center to center of end pins. These spans have a total weight of about 416 tons and were fabricated by the Mount Vernon Bridge Company, Mt. Vernon, Ohio. This new bridge is on the main line between the Atlantic seaboard and Cincinnati and St. Louis and the erection will be performed without interference to scheduled traffic.

CHICAGO UNION STATION.—This company is calling for bids for additional foundation work under the head house required to meet a new type of building and for construction of the first section of the head house known as "Canal Street Space," this work to include the preparation of site foundations, retaining walls, rough floor construction, erection of steel work and building of roadway and sidewalks below and some distance on either side of Canal street between Jackson and Adams streets. This work also includes the installation of plumbing, lighting and heating to adapt the space for use as a temporary passenger station.

DENVER & SALT LAKE.—This company is giving immediate consideration to plans looking to the early commencement of the construction of a tunnel through the continental divide and to the extension of its present line from Craig, Colo., in a north-westerly direction through the Uintah Basin to Provo or Springville, Utah, as the result of the action of the governor of Colorado in signing the Moffat tunnel bill on May 12, providing for the financing of this project. This tunnel will be approximately 6½ miles long, to construct which the law authorizes a bond issue of \$6,720,000. Provisions are contained in the law for the tunnel to accommodate telegraph and telephone lines, power and water lines and vehicles as well as the railroad. A board of five commissioners is to be appointed by the governor, with full power under the law to prescribe all regulations concerning tunnel.

ERIE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an additional track from Sparrowbush, N. Y., to Lackawaxen, Pa., about 20 miles.

LOUISVILLE & NASHVILLE.—This company has placed an order with the Roberts & Schaefer Company, Chicago, for N. & W. type cinder plant for installation at Corbin, Ky.

NEW YORK CENTRAL.—This road has awarded contracts to the Walsh Construction Company, Davenport, Iowa, for the grading and masonry in connection with the Castleton bridge and cut-off work.

NORTHERN PACIFIC.—This company, which was reported in the *Railway Age* of May 13 as authorizing the construction of a tunnel and other work on its Phileman line change in western Montana, to cost approximately \$107,000, has awarded the contract for this work to Clifton, Applegate & Toole Company, Spokane, Wash.

PENNSYLVANIA.—This road is asking for bids for the construction of a single-track, half-through girder bridge to carry the tracks of the Bellefonte branch, Williamsport division, over the state highway, Route No. 18, east of Lewisburg, Pa. Approximate quantities of materials are as follows: 600 cu. yd. roadway excavation under track; 1,200 cu. yd. foundation excavation; 400 cu. yd. foundation masonry; 290 cu. yd. abutment masonry; 21 cu. yd. reinforced concrete floor and 45,000 lb. erecting superstructure. The work will be in charge of George Patton, assistant engineer, Milton, Pa.

FOR NEW TERMINAL FACILITIES, the Canadian government is to lend to the Harbor Commissioners of Montreal \$5,000,000. A loan of \$1,500,000 will also be made to the Quebec City Harbor Commissioners for a similar purpose.

Railway Financial News

BALTIMORE & OHIO.—Authorized to Issue Bonds.—This company has been authorized by the Interstate Commerce Commission to issue \$1,840,000 of refunding and general mortgage 6 per cent bonds to be pledged as collateral security for short term notes.

BANGOR & AROOSTOOK.—Authorized to Abandon Line.—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of operation of a branch line extending from a point near Brownville Junction to Katahdin Iron Works, Me., 8.85 miles.

BOSTON & MAINE.—Protest Against Tentative Valuation.—This company and its subsidiaries have filed their protest with the Interstate Commerce Commission against the tentative valuation issued on March 18 in which the company claims that the total value of the properties comprised in its system is not less than \$37,729,860, whereas the commission stated the final value of the used properties as \$234,189,816. The company says that the reported final values, so-called, of the property have been determined arbitrarily and without proper consideration of relevant facts and of all the properties which should be included and represent much less than the true value. The company states that the value of the property wholly owned and used as of the valuation date, June 30, 1914, was not less than \$323,089,000, whereas the commission's tentative figure for property wholly owned and used was \$101,712,972. The protest also claims not less than \$41,576,037 for property used and not owned, \$6,656,600 for property operated as agent, \$154,111 for property used by the Western Union, \$220,360 for property used by the St. Johnsbury & Lake Champlain, \$27,454 for property used by the Central Vermont and \$6,100 for property used by the Conway Electric Street Railway. These items make the total of \$371,000,000 given above. Details of the corrections which the commission is asked to make are given in the protest and the various items of the amounts claimed are set up in parallel columns.

CAMBRIA & INDIANA.—Asks Authority to Issue Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,000,000 of general mortgage 6 per cent bonds, the proceeds to be used to pay promissory notes. The bonds have been conditionally sold to Brown Bros. & Co., of Philadelphia.

CHICAGO & EASTERN ILLINOIS.—Authorized to Abandon Line.—The Interstate Commerce Commission has issued a certificate as to interstate and foreign commerce authorizing the abandonment of the Chicago & Indiana Coal Railway division, which extends from Brazil, Ind., to a point on the Indiana-Illinois state line, with a branch, comprising in all 162.1 miles of main track. The certificate was issued in spite of the numerous protests that large investments have been made in various business enterprises along the line and many industries have been established that require railroad facilities and have no other railroad connection. It was shown that there were grain elevators at 29 stations and there are some 48 towns and villages along the line, of which 32 are not served by any other railroad. For many years block coal constituted approximately 70 per cent of the coal traffic originating on the road and there is now practically no such coal handled by it as the coal fields are substantially worked out. The report says the physical condition of the road is such as to make operation over it very expensive and it appears reasonably clear that the territory traversed is not productive of sufficient traffic to justify its operation as an independent line and that there is no reasonable expectation that the territory ever will produce sufficient tonnage to enable the property to pay its operating expenses. The commission says the issuance of the certificate will not preclude or prejudice making of arrangements for the taking over of the road or parts of it by any carrier or persons able to finance its continued operation.

CHICAGO & NORTH WESTERN.—Annual Report.—This company's annual report for 1921 is reviewed in an article elsewhere in this

issue entitled "C. & N. W. Revenue Tons Decreased 34.92 Per Cent." See also excerpts from annual report on adjacent pages.

CHICAGO, PEORIA & ST. LOUIS.—Partial Payment Certified.—The Interstate Commerce Commission has certified to the Secretary of the Treasury a partial payment on account of this company's six months guaranty of \$55,000.

CHICAGO, ROCK ISLAND & PACIFIC.—Equipment Notes Offered.—Freeman & Co. and Hayden, Stone & Co. are offering \$2,345,000 Chicago, Rock Island & Pacific Railway 6 per cent equipment trust notes which have been stamped as subordinate in lien to \$4,690,400 prior lien notes now outstanding. The notes mature annually from January 15, 1923, to January 15, 1935, and are offered at prices to yield from 5.25 to 5.75 per cent.

This is the first offering of this kind of the notes which the director general of railroads has sold. During recent months there has been sold to bankers more than \$250,000,000 in equipment trust notes. About \$100,000,000 of these notes represented two-thirds of the cost of equipment purchased by the government for the railroads, the remaining one-third of these issues being stamped as subordinate in lien, in accordance with a special supplemental agreement. These stamped notes were taken by the government and have been held since the sale of the prior lien obligations. The bankers have selected the notes of the Rock Island as the most attractive of the subordinated notes.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—Asks Authority to Sell Bonds.—This company has applied to the Interstate Commerce Commission for authority to sell at not less than 93½, \$2,700,000 of its 5 per cent debenture gold bonds of 1920 now held in the treasury, to reimburse the treasury for expenditures.

Annual Report.—This company's annual report for 1921 is reviewed in an article elsewhere in this issue entitled "C. St. P. M. & O. Also Shows Deficit."

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—Authorized to Abandon Line.—The Interstate Commerce Commission has authorized the abandonment of the present line from Glenn to St. Clair, Ind., 5 miles, incident to a relocation which will substitute a line of 4.6 miles.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—Dividend Resumed.—The directors have declared a dividend of 2 per cent on the common stock, payable June 15 to stock of record June 2, the first dividend disbursement since September, 1910. The action of the directors was announced merely as a dividend, without mention of any definite period. The earnings on the common stock in 1921 have been estimated at around \$8 a share.

GEORGIA, ASHBURN, SYLVESTER & CAMILLA.—Organization Formed.—This company, which was authorized to purchase that part of the Hawkinsville & Florida Southern from Ashburn to Camilla, Ga., a distance of 51 miles, as noted in last week's issue, has elected the following board of directors: J. M. Pidcock, C. W. Pidcock, J. R. Hackett, J. J. Hill, C. W. Pidcock, Jr., L. G. Cox, all of Moultrie; T. C. Jeffords and C. W. Hillhouse, Sylvester; George Betts and J. L. Evans, of Ashburn; J. W. Butler, J. E. Brooks, and G. L. Wade, of Camilla.

Service on the Hawkinsville & Florida Southern was suspended last November. Plans for resuming service are being hurried by the new company and it is expected that trains will be in operation early in June.

HAWKINSVILLE & FLORIDA SOUTHERN.—Part of Line Purchased.—See Georgia, Ashburn, Sylvester & Camilla.

MARSHALL & EAST TEXAS.—Hearing on Application to Dismantle.—A final hearing has been set for June 12 at Texarkana, Texas, by the United States Court for the Eastern District of Texas, on the application of Bryan Snyder, receiver, for authority to dismantle and dispose of the remaining property of the Marshall & East Texas for the benefit of its creditors.

MORENCI SOUTHERN.—Authorized to Abandon Line.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon as to interstate and foreign commerce its narrow gage line from Guthrie to Morenci, Ariz., 18 miles. Following the decision of the Supreme Court in the Eastern Texas railroad case, the commission's finding and order will deal only with interstate and foreign commerce.

NEW YORK CENTRAL.—Authorized to Lease Chicago Terminal Properties.—The Interstate Commerce Commission has issued an order approving and authorizing the acquisition by the New York Central of control of the Chicago River & Indiana by the purchase of its capital stock and the acquisition by the Chicago

River & Indiana of control of the Chicago Junction by lease, subject to 17 conditions. The commission denied authority to the New York Central to purchase the capital stock of the Chicago Junction or its physical properties without prejudice to future proceedings. (Further details regarding report of commission are published elsewhere.)

Annual Report.—This company's annual report for 1921 is reviewed in an article on another page of this issue, entitled "N. Y. Central Surplus After Dividends \$9,747,588." See also excerpts from annual report on adjacent pages.

NEW YORK, NEW HAVEN & HARTFORD.—Extension Plan Operative.—President Edward J. Pearson has informed noteholders of the 4 per cent 15-year European Loan of 1907, that the extension provided in the agreement of March 8, 1922, is operative. Under the terms the noteholders are entitled to a 10 per cent cash payment, with interest payable at the rate of 7 per cent. Holders of certificates of deposit are asked to deposit them with the depository on or after May 22, 1922, to receive the new certificates and the cash payment. The time within which holders of undeposited obligations may become parties to the agreement is extended, subject to termination without notice.

NORTHERN PACIFIC.—Annual Report.—The annual report issued this week shows the following income account for the year ended December 31, 1921:

	1921	1920
Average mileage operated.....	6,658	6,653
Operating revenues.....	\$94,538,059	\$113,084,408
Operating expenses.....	77,630,867	100,983,874
Net railway operating revenue.....	16,907,192	12,100,534
Railway tax accruals.....	9,014,121	10,108,686
Railway operating income.....	7,875,176	1,973,378
Equipment rents—net.....	1,445,606	4,696,162
Joint facility rent—net.....	1,523,044	1,279,918
Net railway operating income.....	10,843,826	7,949,458
Dividend income.....	21,858,646	4,353,552
Total non-operating income.....	26,552,683	7,265,213
Gross income.....	37,396,509	15,214,671
Interest on funded debt.....	14,480,680	12,134,438
Total deductions from gross income.....	15,331,110	12,441,358
Net income.....	22,065,399	2,773,313
Compensation under contract with U. S. Govt. Guaranty under Transportation Act of 1920.....		5,301,309
Deduct, federal income, January and February, 1920, included above.....		5,301,309
Net corporate income.....	22,065,399	3,741,045
Dividend appropriations of income.....	17,360,000	19,094,183
Income balance for the year, transferred to profit and loss.....	4,705,399	1,734,183

ROCK ISLAND SOUTHERN.—Six Months' Guaranty Certified.—The Interstate Commerce Commission has issued a certificate stating the amount necessary to make good this company's guaranty for the six months period of 1920 at \$58,711.

SACRAMENTO NORTHERN.—Proposed Acquisition.—See Western Pacific.

SOUTHERN.—Equipment Trust Certificates Authorized.—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of \$9,300 equipment trust certificates to be issued by the Pennsylvania Company for Insurance of Lives and Granting Annuities, to be sold at not less than 97½.

TONOPAH & GOLDFIELD.—Six Months Guaranty Certified.—The Interstate Commerce Commission has certified the amount necessary to make good this company's guaranty for the six months period of 1920 as \$96,683, of which \$16,683 remains to be paid.

VIRGINIAN.—Annual Report.—The annual report for the year ended December 31, 1921, shows the following income account:

	1921	*1920
Operating revenue:		
Freight.....	\$15,681,361	\$13,901,140
Passenger, including excess baggage and club car fares.....	978,765	798,531
Gross revenue.....	18,024,357	15,989,750
Operating expenses:		
Maintenance of way and structures.....	2,547,898	1,965,229
Maintenance of equipment.....	3,902,349	3,177,424
Traffic expenses.....	123,080	91,735
Transportation.....	5,540,613	5,518,806
General.....	369,515	350,688
Total operating expenses.....	12,405,728	11,085,299
Net revenue from operation.....	5,618,629	4,904,451
Taxes.....	1,043,175	1,026,492
Income from operation.....	4,575,084	3,877,944
Gross income.....	5,374,675	4,819,568
Interest on funded debt.....	1,642,000	1,572,017
Total deductions.....	2,436,943	2,045,472
Net income.....	2,937,732	2,774,097
Minimum compensation, two months, 1920.....		513,365
Additional compensation received from U. S. Government for rent during years 1918, 1919 and two months, January and February, 1920.....	2,308,095	

Net income carried to profit and loss.....	5,245,827	3,287,462
Average mileage in operation.....	526	524

*Corporate operation, March to December.

Asks Authority to Issue Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$909,000 of first mortgage 5 per cent, 50-year gold bonds to be pledged with other collateral as security for a note for \$2,000,000 to the director general of railroads. The company has also asked authority to guarantee a similar amount of bonds to the Virginian Terminal Railway, which that company also asks authority to issue.

WESTERN PACIFIC.—Authority to Acquire Sacramento Northern Denied.—The Interstate Commerce Commission has denied without prejudice to a new application, the application of this company for authority to acquire control of the line of the Sacramento Northern Railroad upon its transfer to the Sacramento Northern Railway by the purchase of the capital stock of the latter and the purchase of the bonds of the railroad. The denial is based on the ground that the Sacramento Northern, which operates an electric line of 165 miles in California, is a carrier which must make application to the commission for authority to issue securities and not merely an electric interurban railroad, and that until application of the new Sacramento Northern Railway for authority to issue its securities is made, the commission is unable to pass upon the public interest involved in the acquisition of control in such company by the Western Pacific. Commissioner Daniels filed a dissenting opinion.

WISCONSIN CENTRAL.—New Directors.—A. L. Osborne, of Oshkosh, Wis., has been elected a director. G. W. Webster has been elected a director to succeed C. E. Wales, resigned. Edmund Pennington has retired as president to become chairman of the board.

Railroad Administration Settlements

The Railroad Administration has announced this week final settlements for the federal control period and has paid the amounts named to the following companies: Pacific Fruit Express, \$2,925,000; Piedmont & Northern, \$100,000; Durham & Southern, \$75,000; Pueblo Union Depot & Railroad Co., \$7,700.

Dividends Declared

Cincinnati, New Orleans & Texas Pacific.—Preferred, 1¼ per cent, quarterly, payable June 5 to holders of record May 25.
Fonda, Johnstown & Gloversville.—Preferred, 1½ per cent, quarterly, payable June 15 to holders of record June 10.
Hocking Valley.—2 per cent, semi-annually, payable June 30 to holders of record June 9.
New Orleans, Texas & Mexico.—1½ per cent, quarterly, payable June 1, to holders of record May 23.
Chicago, Rock Island & Pacific.—Six per cent preferred, 3 per cent, semi-annually, seven per cent preferred, 3½ per cent, semi-annually; both payable June 30 to holders of record June 9.
Chesapeake & Ohio.—2 per cent, semi-annually, payable June 30 to holders of record June 2.
Mobile & Birmingham.—Preferred, 2 per cent, semi-annually, payable July 1 to holders of record May 31.

Trend of Railway Stock and Bonds Prices

	May 23	Last Week	Last Year
Average price of 20 representative railway stocks.....	66.64	64.31	54.71
Average price of 20 representative railway bonds.....	86.65	85.87	74.10

AT THE THIRD TRIENNIAL convention of the Brotherhood of Railway Clerks, Freight and Express Handlers and Station Employees, held recently in Dallas, Tex., E. H. Fitzgerald of Cincinnati, Ohio, was re-elected grand president, and R. F. Dee, New Orleans, La., J. H. Sylvester, Spokane, Wash., G. H. Harrison, St. Louis, Mo., G. C. Milam, Kansas City, Mo., and C. R. Briceland, Pittsburgh, Pa., vice-presidents. G. S. Levi, grand secretary-treasurer, was also re-elected, as was P. E. Ziegler, editor and manager of "The Railway Clerk," official publication of the organization. The convention discussed a proposition to erect a building in Cincinnati for the purpose of establishing a bank and the national headquarters of the order. The next convention will be held in Kansas City, Mo., in 1923.

Annual Reports

Sixty-second Annual Report of the Chicago and North Western Railway Company

REPORT OF THE BOARD OF DIRECTORS

To the Stockholders of the Chicago and North Western Railway Company:

The Board of Directors submits herewith its report of the operations and affairs of the Company for the year ending December 31, 1921.

Average mileage of road operated, 8,402.28.

OPERATING REVENUES:	
Freight	\$95,687,013.19
Passenger	33,770,081.94
Other Transportation	12,924,937.70
Incidental	2,393,442.69
	<hr/>
	\$144,775,475.52
OPERATING EXPENSES (89.17 per cent of Operating Revenues)	129,091,427.62
	<hr/>
Net Revenue from Railway Operations	\$15,684,047.90
RAILWAY TAX ACCRUALS (5.85 per cent of Operating Revenues)	\$8,464,087.20
UNCOLLECTIBLE RAILWAY REVENUES	18,077.64
	<hr/>
	8,482,164.84
Railway Operating Income	\$7,201,883.06
EQUIPMENT AND JOINT FACILITY RENTS—Net Debit	550,745.68
	<hr/>
Net Railway Operating Income	\$6,651,137.38
NON-OPERATING INCOME:	
Compensation for Lease of Road to U. S.	
Government	\$568,101.92
Rental Income	Dr. 324,993.93
Dividend Income	2,577,208.00
Income from Funded Securities	20,726.11
Income from Unfunded Securities and Accounts, and Other Items	1,094,344.65
	<hr/>
	3,935,386.75
Gross Income	\$10,586,524.13
DEDUCTIONS FROM GROSS INCOME:	
Rental Payments	\$14,705.33
Interest on Funded Debt	11,218,007.73
Other Deductions	599,243.73
	<hr/>
	11,831,956.79
Net Loss	\$1,245,432.66
DIVIDENDS:	
7% on Preferred Stock	\$1,567,650.00
5% on Common Stock	7,257,625.00
	<hr/>
	8,825,275.00
Balance Loss for the Year	\$10,070,707.66

GENERAL REMARKS

In his last annual report it was stated that the account with the Director General of Railroads for the period of Federal control had not then been settled. During the early part of the year 1921 the Company received cash payments on this account totaling \$9,000,000.00, and in September, 1921, under authority of the Board, a final settlement was made under which the Company received \$6,500,000.00 in cash. The settlement was in full for all claims of the Director General against the Company for expenditures made by him for additions and betterments, liabilities and expenses paid and all other transactions payable by the Company under the provisions of the contract, and for all claims of the Company against the Director General for balance due on compensation, cash and other assets taken over or collected by him, deficiency in material and supplies, road and equipment retired, accrued depreciation, under-maintenance, etc.

With this settlement the Company is in nowise indebted to the United States Government for matters growing out of or incident to Federal control.

The settlement of the accounts under the guaranty provisions of the Transportation Act, 1920, has not been made. All reports and information requested by the Interstate Commerce Commission to enable it to determine the amount due have been furnished and it is expected that this matter will be closed out in the near future.

The effect of the war and the attendant high level of prices and wages still exercise an influence of the greatest importance in keeping operating expenses at an abnormally high level. Some reduction has been possible. Effective July 1, 1921, the United States Railroad Labor Board promulgated an order creating a scale of wages which averages about 11½% lower than the scale established by it in 1920. This new scale was accepted and put into effect by the Company in every particular and the reductions were accepted by the employees. The Company likewise made proportionate reductions in the wage scales of such of its employees and subordinate officials as were not embraced in the order of the Labor Board.

These reductions in wage scales were not, however, sufficient to fully offset declining revenues and further reductions in payrolls were necessary and were brought about by reducing forces.

The total amount included in Operating Expenses during the year for labor was \$77,844,144.00. This compared with \$100,550,396.00 included in the year 1920. This railway company, along with practically every other in the United States, is at the present time before the Labor Board seeking to secure further reductions in the wage scales of employees. At the present time the average wage scale is 60% above that of 1917.

The year 1921 was a year of widespread business depression, which naturally had its effect upon the affairs of your Company. Manufacturing and merchandising throughout the country declined greatly, and as a result

the traffic in manufactured products and in raw materials used in their manufacture was reduced correspondingly.

The volume of iron ore traffic handled declined from 13,978,103 tons in 1920 to 3,607,582 in 1921, a loss of 74.19%. The volume of bituminous coal handled declined from 10,254,478 tons in 1920 to 6,235,916 tons in 1921, a loss of 39.19%. During the year 1920 these two items constituted 40% of the tonnage shipped over the road. Forest products declined from 6,883,662 tons in 1920 to 5,288,176 tons in 1921, a loss of 23.18%. The volume of manufactured products declined from 11,233,090 tons in 1920 to 7,225,477 tons in 1921, a loss of 35.68%. Products of agriculture moved in greater volume during the year 1921 than in 1920; the total tonnage in 1920 was 7,418,564 and this was increased to 7,767,958 in 1921, or 4.71%. This increase was due almost entirely to the great increase in the amount of corn marketed during the year 1921. Animals and animal products decreased slightly from 2,333,186 tons in 1920 to 2,194,666 tons in 1921. While the products of agriculture are an important element of traffic and while the volume increased, the total tonnage was only 7,418,564 tons in 1920 compared with 52,856,643 tons of other traffic, so that the gain in tonnage of agricultural products was insignificant in comparison with the losses in ore, coal, forest products and manufactured products.

Due to the reduction in traffic handled, substantial reductions in operating costs were effected, but it was impossible to reduce the operating costs in proportion to the loss of traffic. The total loss in tonnage was 34.92%. Freight train miles were reduced 15.73%; freight switching locomotive miles were reduced 25.45%; loaded car miles were reduced 20.92%; while empty freight car miles were reduced less than 1%.

The kinds of traffic which suffered the heaviest loss were of the character that can be loaded most heavily and handled with the least amount of station service. Proper service demands that trains be run at sufficiently frequent intervals, regardless of whether or not they can be loaded to capacity. Owing to the fact that the volume of agricultural products remained normal, whereas the movement of other products declined from 25% to 50%, the traffic was unbalanced, and this contributed to the empty car mileage in a very marked degree, and the relation of empty car miles to the total rose from 33% in 1920 to 38% in 1921.

Passenger traffic likewise declined, not, however, as much in proportion as the decline in freight traffic. The total number of passengers carried dropped from 40,692,627 in 1920 to 35,685,702 in 1921, loss of 12.30%.

On March 19, 1921, an explosion occurred in the Company's Chicago terminal elevator, as a result of which it was seriously damaged. As soon as the grain contained therein could be salvaged and the debris cleared away the work of restoration was started. More complete details concerning the matter are contained in the report in the remarks pertaining to construction and maintenance. Under the rules of the Interstate Commerce Commission, the cost of replacement of this property is chargeable to Income Account, therefore, such expenditures made during the year, amounting to \$957,824.37, are included in the item "Rental Income," as shown herein, thereby reducing the Net Income for the year by that amount.

PENSIONS

During the year, 177 employees were retired from the service of the Company and granted pensions. Of these retirements, 82 were on account of employees having reached the age of 70, and 95 were on account of employees having suffered permanent physical disability.

On December 31, 1921, there were 1,190 retired employees receiving pensions. The average monthly pension in force on that date was \$32.80. The amount paid in pensions during the year was \$439,922.96.

Since the inauguration of the pension system, the total payments made from January 1, 1901, to December 31, 1921, was \$4,243,953.34.

FEDERAL VALUATION

The work of valuation of the property by the Interstate Commerce Commission has progressed, but has not been completed. The engineering report of the Commission has been finished, but has not been served upon the Company. The Land and Accounting Sections have not completed their work, and it is anticipated that it will be considerable time before a tentative final valuation will be completed and served. During the year 1921, \$393,920.13 was expended by the Company. Since the commencement of this work \$2,134,856.07 has been expended on it by the Company.

CONSTRUCTION AND MAINTENANCE DURING THE YEAR 1921

Expenditures for construction were held to the minimum necessary to provide for the most urgent demands. This was because of the continuing high cost of labor and material. The following were the principal items of work carried out during the year:

Chicago Terminal Elevator.—The explosion of March 19, 1921, caused damage to various parts of the structure above the foundation throughout the entire main building, as well as adjacent buildings. At the time of the explosion approximately seven million bushels of grain were in the elevator. As soon as the operators were able to remove this grain, the work of reconstruction was begun and it has progressed at favorable speed, and the elevator will be in shape to receive grain this season.

Clinton, Iowa.—During the fall, work was resumed on the grade separation project by commencing construction of a subway in Fourth Street carrying the tracks of the Chicago & North Western, Chicago, Burlington & Quincy, and the Chicago, Milwaukee & St. Paul Railways. This is of concrete construction. The excavation work and a large portion of the concrete retaining walls and abutments have been completed.

Kenosha, Wisconsin.—The work of building a viaduct over the tracks leading to the Simmons Company and the Bain Wagon Company plants, which is being carried out in conjunction with the construction by the City of Kenosha of a new bridge over the river at Main Street, was carried forward and the viaduct proper was completed.

Racine, Wisconsin.—As a result of the project being carried forward by the City of Racine involving the straightening and widening of Sixth Street and the rebuilding of a new city bridge to carry Sixth Street over the Root River, the company was required to rebuild its subway at Sixth Street. The plan required the construction of a new abutment at the north end of the subway and the moving and lengthening of the present span. About 50% of the work was finished during the year. The City of Racine will pay about 80% of the cost of the work.

Chicago, Illinois.—Additional facilities in the Erie Street coach yard, consisting of a two-story brick building 22' x 102' to provide quarters for car repairers and coach cleaners, a brick oil house 20' x 30', and a concrete

wheel pit were provided. 3,000 lineal feet of additional coach storage tracks were also added to the yard.

Chicago, Illinois.—A new steam heat plant to serve the Wells Street Annex building and the American Railway Express Company building was installed in the basement of the Annex building. Heat was formerly secured for these buildings from the old power house at Kinzie and Kingsbury Streets. A saving of about 50% in operating cost will result.

Proviso, Illinois.—The wooden floor and trestle approaches of bridge 16½, carrying a highway over Proviso yard, were destroyed by fire in August, 1921. The structure was restored. The work consisted of building 950 lineal feet of pile trestle approach and providing new floor for the steel structure 810 feet in length.

Ashland, Wisconsin.—The 840-ft. extension to ore dock No. 3, referred to in the last annual report, was completed. This extension is of timber construction of the same character as the existing dock, and adds 140 pockets to the dock, making its total capacity 340 pockets.

West Chicago, Illinois.—A modern mechanical coaling chute of 300 tons capacity was built to replace the former coaling chute, which was destroyed by fire.

Casper, Wyoming.—Approximately 13,000 feet of storage tracks were built to provide additional storage room for oil tank cars so as to care for additional business of the refineries located at this point. The capacity of this additional track is 300 cars.

During the year the following important bridges were constructed:

Fremont, Neb.	Bridge B-8—Eight additional concrete piers were built to replace present pile piers.
Owanka, S. D.	Bridge 1888—60' single track shallow through plate girder on concrete piers, replacing 4 spans of 23 span pile bridge. Sub-structure completed.
Oral, S. D.	Bridge H-87—85' single track deck plate girder with concrete slab deck on concrete abutments to replace 11 span pile bridge. Sub-structure completed.
Ida Grove, Iowa.	Bridge 1290—90' single track, shallow through plate girder span on pile piers. 3 span pile bridge to replace a 126' Howe Truss span and 2 pile piers. Sub-structure completed.
Battle Creek, Iowa	Bridge 1310—90' single track, shallow through plate girder span on pile piers and 3 span pile bridge to replace 126' Howe Truss span and 2 pile piers. Sub-structure completed.
Wausau, Wis.	Bridge D-37-B—Second-hand steel spans on cylinder piers and concrete abutments to replace Pony Howe Truss spans on timber and pile approach. Sub-structure completed.
Woodbine, Iowa	Bridge 920½—60' double track shallow through plate girder span on concrete abutments, replacing 2 span pile bridge, 2 span deck plate girder and I-beam, 1 span pile bridge. Sub-structure completed.
Bando, Ill.	Bridge 1863—Two 85' deck plate girder spans, shifting 60' deck plate girder span and constructing one concrete abutment and two concrete piers to replace portion of 14 span pile and frame bridge. Sub-structure completed.
Bando, Ill.	Bridge 1948—One 40' and two 85' single track deck plate girder spans on concrete abutment and two concrete piers to replace Section 1 of 18 span pile and frame bridge. Sub-structure completed.
Creston, Ill.	Bridge 117—64' double track through plate girder with concrete slab deck on present masonry to replace 64' double track through plate girder span. Completed.
DePere, Wis.	Bridge 1272—Second-hand steel spans on cylinder piers and present masonry remodeled to replace Section 1 of 8 span Pony Howe Truss Bridge. Sub-structure completed.
Ben'd, Ill.	Bridge 2008—Approximately 80,000 yards of filling was placed. This brings the filling up to within about 10 feet of the track; it being proposed to eventually fill this portion of the structure up to the track.

RAIL RENEWALS

126.41 miles of track were renewed with new rail and 225.68 miles were renewed with relay rail.

TIE RENEWALS

2,667,562 cross ties were laid in renewals in main and side tracks.

NEW EQUIPMENT

During the year the equipment, which it was stated in the last annual report had been arranged for, was delivered and put into service. This equipment consists of the following:

40	Class "J" Mikado type freight locomotives.
20	Class "E" Pacific type passenger locomotives.
500	Steel ore cars.
50	Steel underframe caboose cars.
250	Steel underframe refrigerator cars.
500	Steel underframe stock cars.
25	Steel vestibule passenger coaches.
9	Steel vestibule smoking cars.
2	Steel postal cars.
23	Steel baggage cars.
3	Steel combination baggage and mail cars.

In addition to the foregoing, the Company has awarded contracts for the following passenger equipment to be delivered prior to June 30, 1922:

20	Steel vestibule passenger coaches.
10	Steel vestibule smoking cars.
3	Steel vestibule chair cars.
3	Steel combination smoking and baggage cars.
9	Steel baggage cars.
5	Steel combination baggage and mail cars.

MILES OF RAILROAD

The total number of miles of railroad owned December 31, 1921, was: 8,328.86 miles

In addition to which the Company operated under Trackage Rights:

In the City of Peoria, Illinois.....	2.02 miles
(Peoria & Pekin Union Railway)	

Churchill to Ladd, Illinois.....	2.80 "
(New York Central Railroad)	
Broadway Station, Council Bluffs, Iowa, to South Omaha, Nebraska.....	8.73 "
(Union Pacific Railroad)	
Blair to Omaha, Nebraska.....	24.70 "
Elroy to Wyeville, Wisconsin.....	22.79 "
In Sioux City, Iowa.....	2.28 "
(Chicago, St. Paul, Minneapolis & Omaha Railway)	
Sioux City to Wren, Iowa.....	10.10 "
(Illinois Central Railroad)	

73.42 "

Total Miles of Railroad Operated December 31, 1921..8,402.28 miles

The above mileage is located as follows:

In Illinois	824.53 miles
" Wisconsin	2,160.12 "
" Michigan	510.90 "
" Minnesota	650.30 "
" Iowa	1,632.55 "
" North Dakota.....	14.28 "
" South Dakota.....	1,230.45 "
" Nebraska	1,100.80 "
" Wyoming	278.35 "
Total.....	8,402.28 miles

CAPITAL STOCK

The capital stock and scrip of the company held by the public has been reduced \$40,225.00 during the year as follows:

By the purchase of common stock scrip.....	\$225.00
By the purchase of special stock.....	40,000.00
	\$40,225.00

The capital stock authorized by the company is two hundred million dollars (\$200,000,000.00), of which the following has been issued to December 31, 1921:

Held by the Public:

Common stock and scrip.....	\$145,156,903.82
Preferred stock and scrip.....	22,395,120.00
Special stock	25,000.00

Total stock and scrip held by the public..... \$167,577,023.82

Held in Treasury:

Common stock and scrip.....	\$2,342,737.15
Preferred stock and scrip.....	3,834.56

Total stock and scrip held in Treasury..... 2,346,571.71

Total capital stock and scrip, December 31, 1921 \$169,923,595.53

FUNDED DEBT

At the close of the preceding year the amount of funded debt held by the public was..... \$235,616,500.00

The above amount has been decreased during the year ending December 31, 1921, by bonds and equipment trust certificates redeemed as follows:

C. & N. W. Ry. 30-year Debentures, 5%...	\$9,944,000.00
M. L. S. & W. Ry. Consolidated First Mortgage, 6% (including \$12,000 unrepresented and transferred to "Current Liabilities")	4,996,000.00
M. L. S. & W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%.....	22,000.00
C. & N. W. Ry. Sinking Fund of 1879, 6%.	411,000.00
C. & N. W. Ry. Sinking Fund of 1879, 5%.	109,000.00
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%.....	158,000.00
C. & N. W. Ry. Serial Notes, 5¼%.....	300,000.00
C. & N. W. Ry. Equipment Trust Certificates of 1912, 4½%:	
Series A.....	\$300,000.00
Series B.....	300,000.00
Series C.....	397,000.00
	997,000.00
C. & N. W. Ry. Equipment Gold Notes of 1920, 6%	664,900.00

Total Funded Debt redeemed..... 17,601,900.00

\$218,014,600.00

And the above amount has been increased by Bonds and Equipment Trust Certificates sold during the year, as follows:

C. & N. W. Ry. 15-Year Secured Gold Bonds, 6½%, (secured by General Mortgage Gold Bonds of 1987).....	\$15,000,000.00
C. & N. W. Ry. Equipment Trust Certificates of 1920, Series J and K, 6½%. (secured by equipment Series J and K of the Equipment Trust of 1920).....	5,436,000.00
	20,436,000.00

Leaving Funded Debt held by the public, December 31, 1921..... \$238,450,600.00

BONDS IN THE TREASURY AND DUE FROM TRUSTEE

At the close of the preceding year the amount of the Company's unpledged Bonds and Equipment Trust Certificates in the Treasury and due from Trustee was..... \$17,766,000.00

The above amount has been increased during the year ending December 31, 1921, as follows:

C. & N. W. Ry. General Mortgage Gold Bonds of 1987 received, or due from Trustee, in exchange for bonds redeemed during the year.....
Other bonds redeemed during the year exchangeable for C. & N. W. Ry. General Mortgage Gold Bonds of 1987, viz.:

M. L. S. W. Ry. Extension and Improvement Sinking Fund Mortgage, 5%.... \$21,000.00
C. & N. W. Ry. Sinking Fund of 1879, 6%..... 411,000.00
C. & N. W. Ry. Sinking Fund of 1879, 5%..... 8,000.00
C. & N. W. Ry. Sinking Fund Debentures of 1933, 5%..... 153,000.00

C. & N. W. Ry. General Mortgage Gold Bonds of 1987, due from Trustee on account of Construction Expenditures made during the year.....

C. & N. W. Ry. Equipment Trust Certificates of 1920, Series L, 6½%, issued.....

And the above amount has been decreased during the year, as follows:

C. & N. W. Ry. Equipment Trust Certificates of 1912, Series C, 4½%, matured and canceled..... \$3,000.00

C. & N. W. Ry. Equipment Trust Certificates of 1913, 4½%, matured and canceled:

Series D..... 400,000.00
Series E..... 485,000.00
Series F..... 115,000.00

C. & N. W. Ry. Equipment Trust Certificates of 1917, 5%, matured and canceled:

Series G..... 422,000.00
Series H..... 400,000.00
Series I..... 178,000.00

C. & N. W. Ry. General Mortgage Gold Bonds of 1987, 5%, deposited as part security for the C. & N. W. Ry. 15-Year Secured Gold Bonds sold during the year..... 17,988,000.00

Total December 31, 1921, unpledged..... \$17,208,000.00

15,035,000.00

593,000.00

1,000,000.00

2,805,000.00

\$37,199,000.00

19,991,000.00

\$17,208,000.00

The following bonds owned by the Company and pledged as security for the C. & N. W. Ry. 10-Year Secured Gold Bonds and C. & N. W. Ry. 15-Year Secured Gold Bonds:

\$20,488,000.00

C. & N. W. Ry. General Mortgage Gold of 1987, 5%.... 15,000,000.00

C. & N. W. Ry. First and Refunding Mortgage, 6%....

Total December 31, 1921, pledged..... \$35,488,000.00

LANDS

During the year ending December 31, 1921, 1,040.48 acres and 41 town lots of the Company's Land Grant lands were sold for the total consideration of \$25,191.89. The number of acres remaining in the several Grants December 31, 1921, amounted to 264,909.56 acres, of which 39,891.39 acres were under contract for sale, leaving unsold 225,018.17 acres.

Acknowledgment is made to all officers and employees of their loyal and efficient co-operation and service.

Appended hereto may be found statements, accounts and statistics and the condition of the Company's affairs on December 31, 1921.

By order of the Board of Directors.

W. H. FINLEY, President.

Chicago, April 18, 1922.

PROFIT AND LOSS, DECEMBER 31, 1921

Credit Balance, December 31, 1920.....	Cr. \$60,740,397.74
Credits for the Year Ending December 31, 1921:	
Donations.....	193,401.41
Net Profit from sale of Land Grant Lands.....	25,371.42
Final settlement with U. S. Railroad Administration....	9,287,139.22
Miscellaneous Credits.....	89,691.14
	<u>\$70,336,000.93</u>

Charges for the Year Ending December 31, 1921:

Debit Balance of current year's Income, brought forward from Income Account.....	Dr. \$10,070,707.66
Depreciation accrued prior to July 1, 1907, on equipment retired or changed from one class to another.....	368,276.30
Net loss on property sold or abandoned and not replaced.	16,862.68
Debit discount extinguished through surplus.....	824,616.57
Miscellaneous Debits.....	408,591.26
Balance Credit, December 31, 1921, carried to Balance Sheet	<u>58,646,946.46</u>

\$70,336,000.93

GENERAL BALANCE SHEET, DECEMBER 31, 1921

(8,328.86 Miles)

ASSETS		LIABILITIES	
INVESTMENTS:		CAPITAL STOCK	
Road and Equipment—		Held by the Public.....	\$167,577,023.82
Balance to Debit of this Account, December 31, 1920.....	\$441,915,400.77	Held in Treasury.....	2,346,571.71
Add Sundry Construction and Equipment Expenditures for the year ending December 31, 1921, including Trust Equipment	12,030,790.94		<u>\$169,923,595.53</u>
	<u>\$453,946,191.71</u>	Premium Realized on Capital Stock.....	29,657.75
Miscellaneous Physical Property.....	658,860.91		
Investments in Affiliated Companies.....	2,704,238.61	LONG TERM DEBT	
Other Investments—		Funded Debt held by the Public.....	\$238,450,600.00
149,200 Shares of Capital Stock of Chicago, St. Paul, Minneapolis & Omaha Ry. Co.	\$10,337,152.29	Funded Debt held in Treasury and Due from Trustee:	
41,715 Shares of Preferred Stock of Union Pacific Railroad Company.....	3,910,575.93	Unpledged.....	17,208,000.00
\$186,000 C. St. P. M. & O. Ry. Debentures of 1930.....	178,161.25	Pledged.....	35,488,000.00
\$100,000 New York Central & Hudson River R. R. Refunding and Improvement Bonds.....	91,750.00		<u>291,146,600.00</u>
\$64,000 New York Central Railroad Consolidation Bonds.....	60,020.00	CURRENT LIABILITIES:	
Miscellaneous.....	33,665.33	Traffic and Car Service Balances Due to Other Companies.....	\$2,843,926.82
	<u>14,611,324.80</u>	Audited Accounts and Wages Payable....	5,791,358.87
CURRENT ASSETS:		Miscellaneous Accounts Payable.....	425,396.99
Cash.....	\$22,240,899.18	Interest Matured Unpaid.....	948,550.84
Traffic and Car Service Balances Due from Other Companies.....	603,227.97	Dividends Matured Unpaid (including dividend payable January 16, 1922).....	4,419,316.20
Net Balance Receivable from Agents and Conductors.....	2,572,173.39	Unmatured Interest Accrued.....	2,209,855.78
Miscellaneous Accounts Receivable.....	4,587,291.62	Other Current Liabilities.....	1,549,021.22
Material and Supplies.....	12,401,142.10		<u>18,187,426.72</u>
Other Current Assets.....	278,815.34	UNADJUSTED CREDITS:	
	<u>42,683,549.60</u>	Tax Liability.....	\$5,061,086.00
UNADJUSTED DEBITS:		Accrued depreciation—Equipment.....	29,493,332.06
Balance due from U. S. Government (on preliminary estimate included in 1920 report) under Guaranty Section of Transportation Act, 1920.....	\$3,709,184.88	Balance Premium on C. & N. W. Ry. 5% General Mortgage Gold Bonds of 1987..	626,593.01
Miscellaneous Unadjusted Debits.....	3,819,648.82	Other Unadjusted Credits.....	2,025,394.46
Capital Stock and Scrip, C. & N. W. Ry. Co., held in Treasury.....	2,346,571.71		<u>37,206,405.53</u>
Company Bonds held in Treasury and Due from Trustee		CORPORATE SURPLUS:	
Unpledged.....	17,208,000.00	Additions to Property through Surplus...	\$2,034,939.05
Pledged.....	35,488,000.00	Profit and Loss.....	58,646,946.46
	<u>62,571,405.41</u>		<u>60,681,885.51</u>
Total Assets	\$577,175,571.04	Total Liabilities	\$577,175,571.04

[ADVERTISEMENT]

New York Central Railroad Company—Annual Report

To the Stockholders of

THE NEW YORK CENTRAL RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1921, with statements showing the income account and the financial condition of the company.

Road operated

	Mileage operated:		Increase Miles
	1921 Miles	1920 Miles	
Main line and branches owned.....	3,699.19	3,699.19	.....
Leased lines	1,946.64	1,946.62	.....02
Lines operated under trackage rights	452.37	432.37	20.00
Total road operated.....	6,098.20	6,078.18	20.02

The increase in the mileage of leased lines is the result of corrections in measurements of the Beech Creek Railroad. Mileage operated under trackage rights has been increased by the acquisition of rights over the Buffalo Rochester and Pittsburgh Railway from Rossiter to Clearfield and Mahoning Junction, Pennsylvania, 18.33 miles, providing a new route for coal traffic from the mines on the Beech Creek Extension Railroad, and by changes in the mileage of the Cherry Tree and Dixonville Railroad, 1.67 miles.

Traffic conditions

The year 1921 was one of business depression, reflected in the decreased freight and passenger traffic of the company. The tonnage fell off one-third in volume and the passenger traffic approximately one-tenth as compared with 1920. This situation was met by economies in operation.

In co-operation with the federal government in its effort to lower costs of foodstuffs, voluntary decreases in rates on certain agricultural products were put in effect during the year. There was no general reduction in other freight rates but adjustments were made from time to time to remove inequalities. The company has co-operated with state authorities in a readjustment of rates on road-making material for the purpose of stimulating the building of good roads and to meet the unemployment situation.

There was no general readjustment of passenger rates but the practice which obtained prior to federal control of putting into effect reduced excursion rates during the summer months was re-established to some extent. By an order of the Interstate Commerce Commission made pursuant to the provision of the Transportation Act, 1920, the company in 1921 was given the full benefit of the increase in fares under the Commission's order of July 29, 1920, Ex Parte 74, notwithstanding the limitation in the New York statute of way passenger fares between Albany and Buffalo to two cents a mile.

Account with Railroad Administration

The company's account with the Railroad Administration covering the period of federal control will be completed in the early part of 1922.

Claim against United States upon the guaranty

The company's claim against the United States based upon its guaranty for the period March-August, 1920, is approaching completion. It has been necessary to re-state this claim several times in accordance with tentative formulas. It will be ready for presentation in the early part of 1922.

Wages

Effective July 1, 1921, the United States Labor Board issued its Decision No. 147 reducing the rates of pay of employees by an amount which aggregated approximately eleven per cent of the payroll. A revision of rules and working conditions for shop employees so modified the lines of demarcation between the various crafts that it is now possible to use a mechanic in one class to do incidental work of another craft. The Board also discontinued the requirement that time and one-half be paid for necessary Sunday service, thus permitting the use of engine terminal and car repair forces for such necessary Sunday work without the payment of a punitive rate. During the federal control period and up to July 1, 1921, all overtime for maintenance of way employees was paid for at the rate of time and one-half, but, under the decision of the Labor Board, the ninth and tenth hours of service may now be paid for at the regular hourly rate. Pending final decision of the Board, certain other classes of employees for whom overtime rates were established by the Director General of Railroads are now receiving the pro rata hourly rate for such overtime. Notwithstanding the reductions in rates of pay and changes in rules above mentioned, the average earnings per employee for the last six months of 1921 as compared with the average earnings per employee in 1917 indicate that wages are still much higher than prior to the federal control period. The company is negotiating with its employees looking to further reductions in pay and further changes in working rules and in some cases these matters have been referred to the Labor Board.

Modified agreement for operation of Providence Webster and Springfield Railroad

Prior to February 1, 1921, this company, as lessee of the Boston and Albany Railroad, paid as rental for the use of the Providence Webster and Springfield Railroad 25 per cent of the gross earnings of that line. By agreement of that date between the Providence Webster and Springfield Railroad Company and the Boston and Albany Railroad Company, the rental was revised so as to limit the annual rental to a maximum of \$15,000. The new arrangement is effective for ten years, and thereafter until terminated by either party on ninety days' notice.

Stock of The Pittsburgh McKeesport and Youghiogheny Railroad Company

During the year the company acquired ten shares, par value \$500, of the common stock of The Pittsburgh McKeesport and Youghiogheny Railroad Company. Its total holdings of this stock at the close of 1921 were 31,347 shares, par value \$1,567,350, or 39.6 per cent of the amount outstanding. The Pittsburgh and Lake Erie Railroad Company owns a like amount of this stock.

Stock of The Mahoning Coal Railroad Company

During the year the company acquired 575 shares, par value \$28,750, of the common stock of The Mahoning Coal Railroad Company. Its total holdings in the stock of this company at the close of the year 1921 were 7,990 shares preferred, par value \$399,500, or 60.4 per cent of the total amount outstanding, and 17,893 shares common, par value \$894,650, or 59.6 per cent of the total amount outstanding.

Purchase of stock by employees

Under authority of the Board of Directors the company adopted a plan under which its employees are given the opportunity to purchase shares of the company's stock at the market price, the purchase price of the stock being deducted from the payroll in equal monthly installments over a period of not exceeding twenty-four months.

Chicago River and Indiana Railroad—Chicago Junction Railway

In the latter part of 1920 this company entered into an agreement with the Chicago Junction Railways and Union Stock Yards Company, subject to approval of the Interstate Commerce Commission, to acquire the Chicago Junction railway properties by the purchase of all of the capital stock of the Chicago River and Indiana Railroad Company and the lease thereto

of all the properties of the Chicago Junction Railways Company. Pursuant to this agreement, this company has made application to the Interstate Commerce Commission for authority to consummate the acquisitions referred to. The application is still pending before the Commission.

Pensions

In the operation of the Pension Department 333 employees were retired and placed upon the pension rolls. Of these retirements 202 were authorized because of the attainment of seventy years of age, and 131 because of permanent physical disability. One hundred and ninety-five pensioners died during 1921. At the close of the year, 1,914 retired employees were carried upon the pension rolls. The average monthly pension allowance of these is \$30.20. The total amount paid in pensions during the year was \$686,354.92.

Changes in property investment accounts

Changes in the property investment accounts for the year, as shown in detail elsewhere in this report, were as follows:

Charges for owned railway property, net.....	\$6,224,193.89
Charges for equipment, net.....	18,924,398.20
Miscellaneous physical property.....	2,068,097.14

Total	\$27,216,689.23
Improvements on leased property (net credit).....	1,981,713.77

Net increase in property investment accounts during the year. \$25,234,975.46

Capital stock

There was no change in the capital stock of the company during the year. The total number of stockholders at the end of the year was 34,328, of whom 33,824 were in the United States and 504 abroad. The par value, on which dividends were paid, held by those in the United States was \$246,053,395 and by those abroad \$3,539,500, the average holdings being 73 shares and 70 shares, respectively.

The following table shows the growth in the number of stockholders from 1915 to 1921, both inclusive:

Date	Total		In United States		Abroad	
	Number	Average holding	Number	Average holding	Number	Average holding
Dec. 31, 1915.....	25,042	100	22,270	104	2,772	64
Dec. 31, 1916.....	22,532	111	21,836	112	696	56
Dec. 31, 1917.....	27,102	92	26,771	92½	331	69
Dec. 31, 1918.....	28,693	87	28,395	87	298	69
Dec. 31, 1919.....	30,445	82	30,180	82	265	67
Dec. 31, 1920.....	32,396	77	32,173	77	223	64
Dec. 31, 1921.....	34,328	73	33,824	73	504	70

In 1916 the company authorized the issue of \$25,000,000 of its capital stock to be sold at not less than par, the company's stockholders being given the right to subscribe for this stock at par. Shortly after the issue of this stock was authorized the market price of the company's stock fell below par and only \$258,900 was disposed of. By resolution adopted on December 14, 1921, the Board amended the previous resolution for the \$25,000,000 stock issue so as to limit the amount of capital stock authorized thereby to the total of \$258,900. By the same resolution, the Board authorized the issue of not exceeding \$23,478,880 of stock for the acquisition of capital stock, common and preferred, of The Cleveland, Cincinnati, Chicago and St. Louis Railway Company, the plan for which is described elsewhere in this report.

Changes in funded debt

There were issued during the year, but classified as nominally outstanding, \$7,000,000 of the company's 6 per cent refunding and improvement mortgage bonds, series B, which were pledged as collateral for a promissory note of like amount given to the Director General of Railroads in part payment for additions and betterments made by him during federal control.

Additional notes amounting to \$155,400 were issued under the equipment trust known as Equipment Trust No. 43 and given to the Director General of Railroads in connection with final settlement for the equipment allocated to the company during the period of federal control and described in the annual report for 1920. The total cost of the equipment was \$18,468,507.59, of which \$13,829,400 was financed by equipment notes.

Equipment trust certificates of 1911 of the Merchants Despatch Transportation Company amounting to \$450,000, hitherto carried in suspense, were transferred during the year to the company's funded debt, as directed by the Bureau of Accounts of the Interstate Commerce Commission.

The changes in the funded debt of the company, in detail, were as follows:

The amount on December 31, 1920, \$748,354,477.42

has been increased as follows:

N Y C R R Co Equipment Trust 6 per cent notes of January 15, 1920, given to the Director General of Railroads.....	\$155,400.00
Merchants Despatch Transportation Company Equipment Trust of 1911, 4½ per cent certificates	450,000.00
	605,400.00

and has been reduced as follows:

Payment of notes:

Two-year promissory note—Gary Land Company \$211,759.04

Two-year promissory note—C L S & E Ry Co. 78,567.21

Serial note—Secretary of the Treasury of the United States, due December 23, 1921..... 996,000.00

Payments falling due during the year and on January 1, 1922, on the company's liability for principal installments under equipment trust agreements as follows:

N Y C Lines Trust of 1907, installment due November, 1921

N Y C Lines Trust of 1910, installment due January, 1922

M D T Co Trust of 1911, installment due July, 1921

N Y C Lines Trust of 1912, installment due January, 1922

Boston & Albany Trust of 1912, installment due October, 1921

N Y C Lines Trust of 1913, installment due January, 1922

N Y C R R Co Trust of 1917, installment due January, 1922

Trust No. 43 of January 15, 1920, installment due January 15, 1921.....

N Y C R R Co Trust of April 15, 1920, installment due April 15, 1921.....

leaving the funded debt on December 31, 1921

\$739,592,968.85

Loans and bills payable

In addition to the funded debt there were outstanding on December 31, 1921, the following loans and bills payable:

Secretary of the Treasury.....	\$6,500,000.00
Director General of Railroads.....	26,500,000.00
Miscellaneous	13,000.00

Total \$33,013,000.00

The indebtedness to the War Finance Corporation of \$17,500,000 and all but \$13,000 of the indebtedness of \$2,432,866.68 to banks, trust companies and individuals, included in the list of loans and bills payable in the annual report for 1920, was paid during 1921.

The company gave to the Director General of Railroads, in reduction of its indebtedness to him for additions and betterments during federal control, its demand note for \$19,500,000, thereby correspondingly decreasing the amount due him for additions and betterments and increasing the amount due him on notes from \$7,000,000 to \$26,500,000.

Loans and bills receivable

Included in loans and bills receivable, amounting to \$13,303,954.37, are United States Certificates C. Indebtedness aggregating \$12,999,480.99 representing a temporary investment of moneys held to provide for certain authorized additions and betterments from time to time as made.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME

(SEPARATE STATISTICS FOR BOSTON AND ALBANY RAILROAD WILL BE FOUND AT THE END OF THIS REPORT)

	Year ended Dec. 31, 1921 5,704.27 miles operated	Year ended Dec. 31, 1920 5,684.25 miles operated	Increase or Decrease 20.02 miles
OPERATING INCOME			
RAILWAY OPERATIONS			
Railway operating revenues.....	\$292,130,995.06		
Railway operating expenses.....	221,768,389.78		
NET REVENUE FROM RAILWAY OPERATIONS	\$70,362,605.28		
Percentage of expenses to revenues	(75.91)		
Railway tax accruals.....	\$18,132,163.17		
Uncollectible railway revenues	54,084.95		
RAILWAY OPERATING INCOME	\$52,176,357.16		
Equipment rents, net debit.....	\$961,046.68		
Joint facility rents, net credit	3,722,724.31		
NET RAILWAY OPERATING INCOME	\$54,938,034.79	\$46,212,792.46A	\$8,725,242.33
MISCELLANEOUS OPERATIONS			
Revenues	\$80,682.51	\$473,803.22	—\$393,120.71
Expenses and taxes.....	43,162.21	268,274.15	—225,111.94
MISCELLANEOUS OPERATING INCOME	\$37,520.30	\$205,529.07	—\$168,008.77
TOTAL OPERATING INCOME	\$54,975,555.09	\$46,418,321.53	\$8,557,233.55
OTHER INCOME			
Additional compensation and adjustment of standard return under contract with Director General of Railroads for use of the company's railroad property during federal control.....	\$4,281,607.57		\$4,281,607.57
Income from lease of road.....	367,389.37	\$84,612.05	282,777.32
Miscellaneous rent income.....	3,423,369.62	1,110,310.57	2,313,059.05
Miscellaneous non-operating physical property	511,893.39	501,876.69	10,016.70
Separately operated properties—profit	32,194.95	1,032,775.29	—\$1,000,580.34
Dividend income	6,316,257.46	6,655,251.13	—338,993.67
Income from funded securities	3,171,612.70	1,009,042.39	2,162,570.31
Income from unfunded securities and accounts.....	2,783,072.72	4,691,028.56	—1,907,955.84
Income from sinking and other reserve funds.....	71,474.65	60,037.34	11,437.31
Miscellaneous income	836,928.37 ^B	225,185.33C	—1,062,113.70
TOTAL OTHER INCOME.....	\$20,121,944.06	\$15,370,119.35	\$4,751,824.71
GROSS INCOME	\$75,097,499.15	\$61,788,440.88	\$13,309,058.27
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads.....	\$6,703,480.51	\$7,170,182.42	—\$466,701.91
Miscellaneous rents.....	1,157,912.85	739,238.35	418,674.50
War taxes accrued.....		1,049,304.88	—1,049,304.88
Miscellaneous tax accruals.....	278,196.10	170,320.54	107,875.56
Separately operated properties—loss	1,323,143.08	267,516.34	1,055,626.74
Interest on funded debt.....	33,598,469.01	30,736,911.26	2,861,557.75
Interest on unfunded debt.....	7,196,207.16	5,776,420.45	1,419,786.71
Amortization of discount on funded debt	553,788.43	440,032.96	113,755.47
Maintenance of investment organization	2,582.26	3,499.72	—917.46
Corporate general expenses.....		247,408.56	—247,408.56
Miscellaneous income charges	1,988,033.97	1,452,917.44C	535,116.53
TOTAL DEDUCTIONS FROM GROSS INCOME	\$52,801,813.37	\$48,053,752.92	\$4,748,060.45
NET INCOME	\$22,295,685.78	\$13,734,687.96	\$8,560,997.82
DISPOSITION OF NET INCOME			
Dividends declared (5 per cent each year).....	\$12,479,641.01	\$12,479,614.76	\$26.25
Sinking funds	68,457.20	4,816.87	63,640.33

TOTAL APPROPRIATIONS OF INCOME

	\$12,548,098.21	\$12,484,431.63	\$63,666.58
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS...	\$9,747,587.57	\$1,250,256.33	\$8,497,331.24

A—Includes compensation accrued under contract with Director General January and February, Guaranty under Transportation Act of 1920 March to August and net railway operating income—corporate—September to December.

B—Includes accrual account Guaranty under Transportation Act, 1920.

C—1920 figures revised to include revenues and expenses prior to January 1, 1918.

D—War taxes for 1921 included in Railway tax accruals.

*Debit balance.

Profit and Loss account

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1920.. \$89,933,555.34

ADDITIONS:			
Surplus for the year 1921.....	\$9,747,587.57		
Profit on road and equipment sold.....	94,999.37		
Sundry adjustments (net), unrefundable overcharges and uncollectible bills.....	175,287.17	10,017,874.11	
			\$99,951,429.45

DEDUCTIONS:			
Surplus appropriated for investment in physical property		\$43,781.85	
Depreciation prior to July 1, 1907, on equipment retired during year.....		617,950.39	
Loss on retired road and equipment.....		140,390.68	802,122.92

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1921..... \$99,149,306.53

Comparison of revenues, expenses and freight and passenger statistics
The following comparisons of revenues, expenses and freight and passenger statistics for 1921 are with those of 1920, including in the latter year similar items of the United States Railroad Administration for January and February.

Revenues, tonnage and passengers

The total operating revenues for 1921 were \$292,130,995.06, a decrease of \$46,493,461.43. These and the following figures exclude the results of operation of the Boston and Albany Railroad, which are separately tabulated in another part of this report.

Freight revenue was \$179,170,832.03, a decrease of \$30,621,376.08. The total revenue tonnage decreased 36,278,248 tons. The principal items making up the decrease in tonnage were anthracite and bituminous coal and coke, 13,865,357 tons, and iron ore, 7,167,030 tons. The remainder of the decrease is well distributed among the other commodities.

Passenger revenue, \$80,432,126.11, decreased \$4,169,514.32. The total number of passengers carried was 54,188,310, a decrease of 6,494,341.

The heavy falling off in freight and passenger traffic during the year more than offset the benefit in earnings from increases in rates which went into effect August 26, 1920.

The revenue from the transportation of mail was \$6,508,491.20, a decrease of \$4,939,966.70. The mail traffic of the company increased in 1921. The decrease in mail revenue is the result of the inclusion in 1920 of large amounts for adjustments covering additional compensation for the entire period of federal control.

Express revenues amounted to \$6,311,135.91, a decrease of \$5,386,434.02, which was due not only to the business depression but also to the operation of the new contract with the American Railway Express Company, effective September 1, 1920.

Rents of buildings and other properties decreased \$1,096,040.49. The greater part of this decrease is due to a change in classification of certain rentals in the Grand Central Terminal area.

The decrease of \$1,108,634.05 in miscellaneous revenue is largely in the revenue from the handling of ore at the docks at Buffalo and Ashtabula, a direct result of the business depression.

Operating expenses

In arriving at the railway operating income for the guaranty period the Transportation Act required that the maintenance allowance should be fixed with reference to the standards and price levels of the test period. The company worked out a tentative factor which resulted in charges to maintenance in excess of actual expenditures and the carrying forward of a reserve at the end of 1920. This factor, however, has proved to be larger than the government is likely to accept. Therefore, entries were made in December, 1921, closing out balances in the maintenance reserves which had been accumulated in 1920; and as operating expenses for that year had been over-accrued by the amount of the reserves, it was necessary to adjust operating expenses in 1921 to offset the overcharge and preserve the continuity of the accounts. In making this adjustment the amount tentatively charged against the government for guaranty period operations was reduced and a corresponding charge was made against non-operating income, as a result of which the net corporate income for 1921 was not affected.

The operating expenses for 1921 by groups as compared with those for 1920, eliminating these adjustments, were as follows:

	Amount	Decrease
Maintenance of way and structures	\$35,621,705.75	\$5,334,299.80
Maintenance of equipment	64,455,870.94	28,840,877.28
Traffic	3,504,504.23	*35,407.63
Transportation	112,561,539.17	46,641,490.21
Miscellaneous	3,894,423.90	912,203.68
General	8,825,925.35	315,588.88
Transportation for investment—Cr.	292,614.66	290,418.55
	\$228,571,354.68	\$82,299,470.77

*Increase.

The substantial decrease in operating expenses reflects the falling off in traffic, the economies effected by the company during the year, and reduction in wages and in costs of material and fuel.

Claims for loss and damage to freight

The charges to operating expenses for loss and damage to freight during the year amounted to \$7,704,044.77, an increase of \$236,040.67 over 1920. Of the claims settled during 1921 only about 25 per cent accrued during that year, the balance being for account of the period prior to federal control, the guaranty period, and the last four months of 1920.

Railway tax accruals—Equipment and joint facility rents

Separate tables setting forth the details of these accounts will be found in another part of this report.

Miscellaneous operations

In 1920 the results of operation of the stockyards at East Buffalo were included in miscellaneous operations while in 1921 they were included in

other accounts. This is the principal reason for the decrease in the net miscellaneous operating income of \$168,008.77.

Non-operating income

Pursuant to the final certificate of the Interstate Commerce Commission, the annual compensation for the possession, use and control of the property of this company and its leased lines under the contract with the Director General of Railroads, is \$56,964,227.60. This is an increase of \$1,161,597.10 over the amount stated in the contract and accrued during federal control. This increase and additional compensation, representing interest on completed additions and betterments put in service prior to February 29, 1920, account for the item of \$4,281,607.57 shown in the income account as additional compensation and adjustment of standard return.

The increase of \$282,777.32 in income from lease of road is mainly attributable to a redistribution in the accounts extending back to March 1, 1920, of bills against the Indiana Harbor Belt Railroad for trackage between Ivanhoe and Dune Park.

Miscellaneous rent income shows an increase of \$2,313,059.05. Of this the greater part is accounted for by an adjustment extending back several years in method of distribution of bills for rental in connection with property in the Grand Central Terminal area and West Side Improvement property in New York City, these rentals having been included in other accounts in 1920.

The account "separately operated properties—profit" shows a decrease of \$1,000,580.34. This decrease is accounted for by a deficit from operation of the Pittsburgh, McKeesport and Youghiogheny Railroad during 1921, as compared with a surplus in 1920.

Dividend income decreased \$338,993.67. This is explained by the receipt of reduced dividends on the stock of The Mahoning Coal Railroad Company.

Increase in income from funded securities of \$2,162,570.31 is mainly due to income received from additional loans to affiliated companies and to the fact that income from such loans in 1920 was included in income from unfunded securities and accounts. This change in classification was made in compliance with a ruling of the Bureau of Accounts of the Interstate Commerce Commission.

Income from unfunded securities and accounts shows a decrease of \$1,907,955.84. A substantial part of this decrease is due to the change in distribution of income from loans made to affiliated companies as above explained and the remainder is accounted for by a decrease in interest accrued on deferred payments of compensation due from the Railroad Administration.

The decrease in miscellaneous income of \$1,062,113.70 is due in part to a rearrangement, for purposes of comparison, of the figures shown in the 1920 report and in part to adjustments in connection with the guaranty period March-August, 1920.

Deductions from gross income

The rental for leased roads decreased \$466,701.91. Due to the falling off in freight traffic, there was a decreased rental, based on gross revenues, paid under the lease of the Mahoning Coal Railroad and this was partially offset by an increase in the amount charged to this account for rental of the Lake Erie and Pittsburgh Railway as a result of changing the status of that road in the accounts from a joint facility to a leased line, pursuant to a ruling of the Bureau of Accounts of the Interstate-Commerce Commission. The increase resulting from the Lake Erie and Pittsburgh adjustment is offset by corresponding changes in other accounts.

Miscellaneous rents increased \$418,674.50. This increase is principally accounted for by adjustment account change in classification of charges for several past years in connection with West Side Improvement property, New York City, and which charges had been included in other accounts.

Miscellaneous tax accruals increased \$107,875.56, largely due to increase in assessments during the year.

The increase in charges account "separately operated properties—loss" was \$1,055,626.74 and is attributable to the fact that in the year 1921 a loss of \$1,351,943.08 in operation of the Boston & Albany Railroad was included as against a loss of \$118,241.92 for the year 1920. For the last four months of 1920 the Boston & Albany showed a loss of \$448,963.62 which was partially offset by the surplus accruing during the federal control months (January and February) and the guaranty period.

The increase of \$2,861,557.75 in interest on funded debt is caused by the accrual of a full year's interest upon the notes given to the United States Government for the loan of December 23, 1920, and on \$25,000,000 collateral trust gold bonds issued September 1, 1920.

The increase of \$1,419,786.71 in interest on unfunded debt is chiefly attributable to accruals of interest on indebtedness to the Director General of Railroads for additions and betterments to road and equipment and on other accounts.

The increase of \$113,755.47 in amortization of discount on funded debt is principally accounted for by the charge-out of a full year's proportion of the discount and expenses in connection with the \$25,000,000 issue of ten-year collateral trust gold bonds.

The decrease of \$247,408.56 in corporate general expenses is due to the inclusion in that account of the expense of maintaining the corporate organization in January and February, 1920, during which period the transportation property of the company was under federal control. Expenses of a similar character subsequent to February, 1920, have been included in railway operating expenses.

The increase of \$535,116.53 in miscellaneous income charges is due in part to a rearrangement, for purposes of comparison, of the figures shown in the 1920 report and in part to adjustments in connection with the guaranty period.

Net corporate income

The net corporate income of the company was \$22,295,685.78 from which were declared dividends of 5 per cent, amounting to \$12,479,641.01. There were appropriations for sinking fund purposes of \$68,457.20. After these deductions, there remained a surplus of \$9,747,587.57, or an increase over the surplus for 1920 of \$8,497,331.24.

If, however, additional compensation credited during the year under the contract with the Director General of Railroads and additional amounts credited in connection with the guaranty under the Transportation Act, 1920, aggregating \$5,613,183.45, are excluded from the income account, the amount representing the surplus on the basis of actual operation of the property would be \$4,134,404.12.

Improvements

Important improvements completed or under way during the year, or contemplated for the near future, are as follows:

New York, N. Y.

Completion of Mail Service and Office Building:

The thirteen story addition to this building has been practically finished and the railroad forces formerly in the main station and post office buildings have moved into the new quarters, and a portion of the former quarters rented to commercial tenants.

New apartment buildings—290 Park Avenue and 300 Park Avenue:

Continuing the development of the use of air-right space above the Grand Central Terminal tracks, two high class buildings occupying the blocks between 48th and 49th streets and 49th and 50th streets, respectively, on the west side of Park Avenue, were completed.

Power plant and transmission improvements, Port Morris and Grand Central Terminal:

The increased demand for electric power for train service and for the new buildings in the Grand Central Terminal area called for additions to the present power facilities. A new 20,000 K.W. turbo generator was installed in the Port Morris power plant and an additional 11,000 volt high tension circuit was installed between Port Morris power station and Substation No. 1 at 50th Street, Grand Central Terminal. At the 50th Street Service plant, one 1,500 K.W. and one 500 K.W. generator have replaced three 500 K.W. generators.

Viaduct across tracks at Mott Haven:

On account of the antiquated condition of the highway bridge over the tracks at East 149th Street, it has been necessary to reconstruct it. The structure has been lengthened to permit the expansion of the company's track facilities. The work was started in 1917 in conjunction with the Interborough Subway extension. The roadway and one sidewalk were completed during 1921 and it is expected that the work will be finished during the spring of 1922.

Castleton, N. Y. Hudson River Connecting Railroad:

The Hudson River Connecting Railroad Corporation was incorporated in 1913 to build a bridge, with approaches, across the Hudson River connecting the West Shore Railroad at Feura Bush with the New York Central Railroad just north of Stuyvesant, together with a branch to connect the Boston and Albany Railroad. The proposed high level bridge route is for the purpose of relieving congestion at the Albany gateway, of avoiding interruption and delay to traffic on account of the frequent opening of the drawbridges over the Hudson River and of obviating the long and steep grades which must be overcome in crossing the Hudson Valley at this point. The improvement will greatly facilitate the movement of freight to and from points in New England and New York City. During the year work was commenced on the building of six piers on the east side of the river.

Cleveland, Ohio. New passenger terminal:

The Interstate Commerce Commission has approved the application outlined in the report for 1920 for the construction of a new union passenger terminal on the Public Square at Cleveland and negotiations with the Cleveland Union Terminals Company for the prosecution of the work have been completed. An engineering organization is being formed to proceed with the construction.

Detroit, Mich. Elimination of highway grade crossings:

The separation of grades at various streets in Detroit under contracts with the City, the first of which was made in 1900, was suspended during the war period. The city has grown very rapidly, especially in the southwesterly portion, and the highway traffic became so heavy over certain streets that the separation of grades was essential. During the year grade separation work has progressed at Livernois, Dix and Waterman avenues. In addition, the City has undertaken at its own expense to open Military Avenue under the railroad's tracks.

Elimination of grade crossings. Various points in state of New York:

Eliminations of grade crossings at various points under orders of the Public Service Commission were under way or completed during the year. Work at East Bridge, Adirondack Division, Fairmount, Auburn Branch, and reconstruction of an existing undercrossing at Martisco, Auburn Branch, were completed during the year. Work on four crossings at Saugerties, River Division, and Poland, Adirondack Division, was in progress and will be completed in 1922.

Proposed purchase of capital stock of

The Cleveland, Cincinnati, Chicago and St. Louis Railway Company

There is outstanding \$9,998,500 of the 5 per cent preferred stock and \$47,028,700 of the common stock of The Cleveland, Cincinnati, Chicago and St. Louis Railway Company, not including \$1,500 of preferred stock and \$27,600 of common stock nominally issued but held in the treasury of that company. The New York Central Railroad Company owns \$30,207,700 of the common stock but none of the preferred, or 52.97 per cent of all of the outstanding stock. Pursuant to authority of the Board, the company, on December 14, 1921, made an offer, subject to the approval of the Interstate Commerce Commission, to the holders of preferred and common stock of The Cleveland, Cincinnati, Chicago and St. Louis Railway Company to purchase the stock on the following bases:

One share of this company's stock for one share of the preferred stock of The Cleveland, Cincinnati, Chicago and St. Louis Railway Company;

Eighty shares of this company's stock for one hundred shares of the common stock of The Cleveland, Cincinnati, Chicago and St. Louis Railway Company.

Thereupon application was made to the Commission for its approval of the acquisition of such stock or so much thereof as might be offered upon the terms stated, and for authority to issue the company's stock up to \$23,478,880 for the purpose of such acquisition.

Proposed lease of the railroads of

The Toledo and Ohio Central Railway Company and its subsidiaries

The Board of Directors of the company, by resolutions adopted on December 14, 1921, authorized, subject to the consent of the holders of two-thirds of the capital stock of the company and the approval of the Interstate Commerce Commission, the taking by the company of a lease, to be effective January 1, 1922, of the property and franchises of The Toledo and Ohio Central Railway Company for the term of the lessor's corporate existence, subject to termination of such lease by the lessee upon ninety days' notice. The proposed lease will include an assignment by the lessor of the leaseholds proposed to be acquired by it, through lease or assignment of lease, of the properties and franchises of The Kanawha & Michigan Railway Company, the Kanawha and West Virginia Railroad Company and The Zanesville and Western Railway Company, such leaseholds to be effective January 1, 1922, and to be for the corporate existence of the respective lessors, subject in each case to termination by the lessee upon ninety days' notice.

The lease will provide for the payment, as rentals, of the fixed charges and taxes of the lessor companies, and in addition thereto amounts annually equal to the net income of The Toledo and Ohio Central Railway Company for the year 1921 and to 6 per cent upon the par value of the stock of The Kanawha & Michigan Railway Company, with a provision that the rentals beyond fixed charges and taxes may from time to time be applied by the lessee so far as necessary for payment of indebtedness of the lessors. This company controls all of the stock of the lessor companies except a few shares of the stock of The Kanawha & Michigan Railway Company. The lease of these properties will effect substantial economies in the expense of operation and accounting.

Changes in organization

On January 26, 1921, Mr. Abraham T. Hardin was elected a Director to fill the vacancy caused by the death of Mr. William K. Vanderbilt.

Mr. Samuel Mather resigned as a Director of the company on February 9th. Appreciative acknowledgment is made to all officers and employees of their loyal and efficient co-operation and service.

For the Board of Directors,

ALFRED H. SMITH,
President.

Railway Officers

Executive

Pursuant to the acquisition of control of the Lake Erie & Western by the Van Sweringen interests, new officers have been chosen as follows: **O. P. Van Sweringen**, chairman of the board of directors; **J. J. Bernet**, president; **M. J. Van Sweringen**, **C. E. Denney**, **J. R. Nutt** and **John Sherwin**, vice-presidents; **W. A. Colston**, vice-president and general counsel; **Lewis A. Bell**, comptroller; **C. C. Collister**, secretary and general treasurer, and **B. E. Morgan**, traffic manager. Headquarters will be Cleveland, Ohio.

Financial, Legal and Accounting

B. D. Warfield, district attorney of the Louisville & Nashville for Kentucky, and **E. Woodward**, general attorney, have resigned to engage in general practice in Louisville, Ky., under the firm name Woodward & Warfield, in which association they have been appointed district attorneys for Kentucky, effective May 15. Effective May 17, **George W. Jones**, district attorney for Alabama and **Judge E. Perry Thomas**, assistant district attorney, have become associated under the firm name of Jones & Thomas, and have been appointed district attorneys for Alabama. Effective the same date, **R. Tate Irvine** and **William H. Stuart**, associated under the firm name of Irvine & Stuart, have been appointed district attorneys for Virginia, with offices at Big Stone Gap, Va. **Harold R. Small** has been appointed district attorney for Missouri with offices at St. Louis, Mo., and **H. K. Rogers** has been appointed district attorney for Ohio, with offices at Cincinnati, O.

Operating

E. Van Dyne has been appointed district superintendent of the Pullman Company with headquarters at Buffalo, N. Y., succeeding **E. G. Kirk**, retired under the company's pension regulations.

R. N. Young, superintendent of telegraph of the Canadian Pacific, with headquarters at Vancouver, B. C., has been transferred to Calgary, Alta., to succeed **D. L. Howard** transferred to Vancouver.

P. J. Flynn, superintendent of the Buffalo division of the Lehigh Valley with headquarters at Buffalo, N. Y., has at his own request been transferred to a similar position on the Mahanoy and Hazelton division with headquarters at Hazelton, Pa. Mr. Flynn's position at Buffalo has been assigned to **F. M. Barker**, superintendent of the Wyoming division with headquarters at Wilkes-Barre, Pa. **P. T. Reilly**, heretofore superintendent at Hazelton, has been transferred to Wilkes-Barre to succeed Mr. Barker.

W. D. Pearce, supervisor of bridges and buildings on the Northern Pacific, with headquarters at Glendive, Mont., has been promoted to general manager of the Walla Walla, a subsidiary of the Northern Pacific, with headquarters at Walla Walla, Wash., effective May 16, to succeed **C. S. Walters**, resigned. Mr. Pearce entered the service of the Northern Pacific on May 16, 1906, as a rodman. He was promoted to instrumentman on November 25, 1908, and on April 23 of the following year was advanced to assistant engineer, which position he held until 1915, when he was promoted to supervisor of bridges and buildings. He left this work in November 25, 1918, to enter the operating department as trainmaster at Forsyth, Mont., but resumed the duties of supervisor of bridges and buildings, with headquarters at Glendive, on April 15, 1921, continuing in this position until his recent appointment.

M. A. Wallace has been appointed first chief train dispatcher of the Southern Pacific and **T. F. Custer** has been

appointed second chief train dispatcher at Dunsmuir, Cal. Other appointments as first, second and third chief train dispatchers are: At Portland, Ore., **C. H. Spencer**, first, **F. W. Cantrell**, second, and **C. H. Eva**, third; at Roseburg, Ore., **J. I. Love**, first, and **C. W. Grubbs**, second; at Marshfield, Ore., **R. C. Harden**, first; at Sacramento, Cal., **O. T. Stackpoole**, first, and **D. A. Neelley**, second; at Oakland Pier, Cal., **C. E. Norton**, first, **D. Blake**, second, and **C. C. Davison**, third; at Ogden, Utah, **Wm. Johnson**, first, and **F. M. Kelley**, second; at Sparks, Nev., **R. E. Beach**, first, and **H. G. Valleau**, second; at Bakersfield, Cal., **E. F. Waseem**, first, and **R. M. McLeod**, second; at Tucson, Ariz., **J. J. Cowin**, first, **J. Shakespeare**, second, and **H. G. Bonorden**, third; at Los Angeles, Cal., **J. A. Day**, first, **T. W. McKinley**, second, and **G. H. Marsh**, third; at Stockton, Cal., **M. A. Michelson**, first, and **C. R. Rice**, second; at San Francisco, Cal., **I. J. Onyon**, first, and **J. T. Bell**, second; at San Luis Obispo, Cal., **G. Merritt**, first, and **D. W. Brophy**, second.

C. E. Carson, whose appointment as superintendent of the Southern division of the Chicago Great Western, with headquarters at Des Moines, Iowa, effective May 15, was reported in the



C. E. Carson

Railway Age of May 20, page 1204, was born at Portsmouth, Ohio, on January 9, 1870, and entered railway service immediately following his graduation from Carleton College, Syracuse, Ohio, on June 13, 1888, as a switchman on the Kansas City Southern at Kansas City, Mo. Thereafter he was employed on the Kansas City Southern and the Missouri Pacific at Kansas City, Mo., successively as switchman, brakeman, conductor, yardmaster and trainmaster until 1903, when he entered the service of the Terminal Railroad Association of St. Louis as

chief clerk in the superintendent's office. He was promoted to superintendent of the Missouri Pacific, with headquarters at Kansas City, in 1897, and consecutively thereafter served as superintendent of the Missouri Pacific, first at Kansas City and later at St. Louis, from 1897 to 1903; as superintendent of the Colorado & Southern at Denver, Colo., from 1903 to 1906; as superintendent of the Missouri Pacific at Kansas City from 1906 to 1908; as superintendent of the Mexican Central at Tampico, Mex., from 1908 to 1911; as superintendent of the Chicago Great Western at St. Paul, Minn., from 1911 to 1913, and as superintendent on the Fort Dodge, Des Moines & Southern at Boone, Iowa, from 1914 to 1917, when he entered military service, where he acted as chief transportation officer of the District of Paris from 1917 to 1919. In October, 1919, he re-entered the service of the Fort Dodge, Des Moines & Southern as general agent with headquarters at Chicago, where he remained until September, 1921, when he became manager of the Traffic Club of Chicago, the position he held at the time of his recent appointment.

Traffic

John F. Fox, traveling immigration agent of the Northern Pacific, with headquarters at Chicago, has been promoted to assistant general immigration agent with headquarters at St. Paul, Minn.

W. Ray Wilson, traveling freight agent of the Gulf Coast Lines, with headquarters at Chicago, Ill., has been promoted to commercial agent, with headquarters at Pittsburgh, Pa., effective May 15, to succeed **L. B. Williams**, resigned.

A. G. Albertson, general agent of the Canadian Pacific, with headquarters at Minneapolis, Minn., has resigned, effective May 1, to become freight and passenger agent of the Royal

Mail Steam Packet and the Pacific Steam Navigation companies, San Francisco.

Paul P. Hastings, formerly assistant general freight agent of the Atchison, Topeka & Santa Fe at San Francisco, and for the last two years a member of the Rate Committee of the Transcontinental Freight Bureau, has been appointed to the newly created position of general freight agent, with headquarters at San Francisco, Cal.

W. L. Donaldson, assistant general freight agent of the Lehigh Valley with headquarters at Buffalo, N. Y., has been appointed general freight traffic agent with headquarters at New York. **Ira F. Auch**, district freight agent with headquarters at Philadelphia, has succeeded Mr. Donaldson at Buffalo. **C. W. Murphy**, general agent at Pittsburgh, has been transferred in a similar capacity to Philadelphia and **C. C. Dailey**, commercial agent at Buffalo, has been appointed general agent at Pittsburgh.

William L. Donaldson, who has been appointed general freight traffic agent of the Lehigh Valley with headquarters at New York, was born on December 4, 1881, at Detroit, Mich.



W. L. Donaldson

He attended grammar school, high school and the classes of Detroit Business University at Detroit and entered railway service as a clerk-stenographer for the Grand Trunk in the division freight office at Detroit. He served in this position for three years and was subsequently employed, first, in the superintendent's office of the Wabash for six months and, next, eighteen months in the office of the general agent of the Chicago & North Western—as a clerk-stenographer and in Detroit in both cases.

In April, 1903, he became a soliciting freight agent at Detroit for the Michigan Central-Lehigh Valley route. Three years later he was transferred in a similar capacity to Sayre, Pa., for the Lehigh Valley. From March, 1907, to September of the following year he was stationed at Auburn, N. Y. He was then promoted to general traveling agent of the Lake Shore-Lehigh Valley-Michigan Central route, with headquarters at Buffalo, N. Y. From August, 1909, to May, 1911, he was agent for the Lake Shore-Lehigh Valley route at Chicago. In May, 1911, he was appointed soliciting freight agent and westbound agent of the Lehigh Valley at Chicago and served in this capacity until March, 1915, when he became chief clerk to the general freight agent at New York. On January 1, 1916, he was promoted to assistant general freight agent at Buffalo and served in that position until his recent promotion.

C. H. Pumphrey, division freight agent of the Baltimore & Ohio, with headquarters at Youngstown, O., has been appointed division freight agent at New York, succeeding **M. J. Bevans**, who has resigned to take up the practice of law. **P. S. Phenix**, division freight agent at Cumberland, Md., has been transferred to New York in a similar capacity. **C. F. Farmer**, division freight agent at Akron, takes Mr. Pumphrey's place as division freight agent at Youngstown, O. **R. J. Beggs**, chief rate clerk in the general freight traffic department at Baltimore, has been promoted to division freight agent at Cumberland, Md.

J. R. Hayden has been appointed assistant traffic manager of the Atchison, Topeka & Santa Fe, with headquarters at San Francisco, Cal., effective May 6. He was born at Bennville, Ind., March 13, 1872, and entered railway service in 1894 as an operator for the Kansas City, Fort Scott & Memphis. He was employed at various points on this road as operator,

agent and dispatcher until 1899, when he entered the service of the Atchison, Topeka & Santa Fe as an agent. After serving as agent at various points until 1906, he was promoted to traveling freight agent, with headquarters at Los Angeles. A year later he assumed the title of industrial agent, in which capacity he served until 1913, when he was promoted to assistant industrial commissioner. He was promoted to general industrial agent, with headquarters at San Francisco in 1918, since which time he has devoted his attention to industrial, agricultural, colonization and general development matters under the direction of the general manager and freight traffic department until his recent promotion.

J. A. McNeill, whose promotion to assistant freight traffic manager of the Tennessee Central, with headquarters at Nashville, Tenn., was reported in the *Railway Age* of May 13, page 1154, was born in New York City, N. Y., November 20, 1881, and entered transportation service on September 1, 1902, as chief clerk to the superintendent of the Clyde Steamship Company, New York. On February 1, 1904, he was promoted to commercial agent, with headquarters at Atlanta, Ga., and on October 1, 1907, was promoted to manager of the Clyde-Charleston Fast Freight Line, where he remained until June 1, 1918, when he entered government service as agent of the United States Shipping Board at Philadelphia. He left this service on March 1, 1919, to engage in the electrical business in Newark, N. J., where he remained until November 15, 1920, when he re-entered transportation service as assistant to the freight traffic manager of the Munson Steamship Line at New York, the position he held until his recent appointment as assistant traffic manager of the Tennessee Central.

M. E. Newell, whose promotion to freight traffic manager of the Tennessee Central, with headquarters at Nashville, Tenn., was reported in the *Railway Age* of May 13, was born at West Newbury, Mass., on August 26, 1868, and entered railway service in July, 1886, as a clerk for the Railway Car Service Association at Boston, Mass. Thereafter he served as clerk in the car service department of the Atchison, Topeka & Santa Fe at Topeka, Kan., and the Chicago, Rock Island & Pacific at Chicago until September, 1890, when he entered the service of the Lake Shore & Michigan Southern as a clerk in the freight office at Chicago. He served in this and other clerical capacities until December, 1897, when he was promoted to northwestern freight agent, with headquarters at St. Paul, Minn., a position he held together with that of agent for the Lake Shore-Lehigh Valley route until January 1, 1900, when he entered the service of the Chicago Great Western as a general agent, with headquarters at Pittsburgh, Pa. He was appointed a division freight agent, with headquarters at Fort Dodge, Iowa, in May, 1904, and resigned in March, 1909, to become associated with the Alberta Clay Products Company, Medicine Hat, Alta. He re-entered railway service on July 1, 1910, as commercial agent for the Tennessee Central, with headquarters at Chicago, and continued in this position until April 1, 1914, when he was promoted to general freight agent, with headquarters at Nashville, Tenn., holding this position until the time of his recent promotion; excepting during the period of federal control, when he served as division freight agent at Nashville.

Mechanical

J. B. Stafford has been appointed master mechanic of the Houston Belt & Terminal, succeeding Fred Hooker, resigned.

H. E. Smith has been appointed engineer of tests of the New York Central Lines with headquarters at New York, effective May 15.

J. McKenzie has been appointed general car inspector of the Pere Marquette with headquarters at Grand Rapids, Mich., succeeding **W. F. Crowder**, who has been promoted to shop efficiency engineer.

Purchasing and Stores

R. M. Nelson, whose appointment as purchasing agent of the Chesapeake & Ohio was announced in the *Railway Age* of April 29, page 1046, was born in Hanover county, Vir-

ginia, on November 6, 1873, and was educated at McGuire's University School, Richmond, Va. After having completed his schooling in 1890, he entered the service of the Chesapeake & Ohio (then the Newport News & Mississippi Valley) as a clerk in the store department at Lexington, Ky. During the following year he served in the same capacity in the freight office and then in the auditor's office at Lexington. In 1892 he went to Ashland, Ky., as a clerk in the freight office and during the same year was transferred to Lexington in the same capacity. In 1901 he was promoted to traveling auditor and, in 1904, was appointed chief clerk in the freight office at Newport News, Va. In January, 1912, he became chief clerk to the purchasing agent at Richmond, Va., and in January, 1916, was promoted to assistant purchasing agent. He was appointed assistant to the director of purchases and stores in April, 1921, and was serving in that position at the time of his recent promotion.

Obituary

E. F. Meedham, retired superintendent of motive power of the Wabash, died in Boston, Mass., on May 12.

Albert F. Rust, consulting engineer of the Kansas City Southern, died at his home in Kansas City, Mo., May 11, at the age of 73.

J. B. Turner, mail superintendent of the Chicago & Alton, and an employee of the company continuously for 49 years, died in Chicago, Illinois, on May 20, after an illness of three months.

John D. Hardin, vice-president and general manager of the East Tennessee & Western North Carolina, with headquarters at Johnson City, Tenn., died at his home in Johnson City, May 21, after having been connected with this railroad for 40 years.

Edward A. Williams, at one time general mechanical superintendent of the Erie, died at his home in Glen Ridge, N. J., on April 29. Mr. Williams was born at Wiscasset, Me., on October 4, 1848. He attended public school at Milwaukee, Wis., and learned the machinist's trade in the Milwaukee shops of the Chicago, Milwaukee & St. Paul. From 1877 to 1880 he was roundhouse foreman for this road at Prairie du Chien, Wis., and thereafter, until 1886, general foreman at Wells, Minn. From 1886 to 1890 he was assistant general master mechanic at Milwaukee. Then, until 1893, he was master mechanic of the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at Minneapolis. He was then promoted to mechanical superintendent, which position he left in 1901 to become superintendent of rolling stock of the Canadian Pacific with headquarters at Montreal. In 1904 and 1905 he was assistant general manager of the Erie and in November, 1905, became general mechanical superintendent, in which position he served until the time of his retirement in 1907.

George W. Smith, until 1920 foreign freight agent of the Pennsylvania, died at his home in Chicago on May 16, after a short illness. Mr. Smith was born in Minnesota on December 10, 1869, and entered railway service on August 16, 1885, as an employee of the Chicago, Milwaukee & St. Paul, where he remained until May, 1903, when he entered the service of the Erie & Western Transportation Company, operators of



E. A. Williams

the Anchor Steamship Line. From December, 1905, to August 1, 1910, he was associated with the Star Union Steamship Line, and from the latter date to January, 1914, he represented this line and the Anchor line at Chicago. He became foreign freight agent of the Pennsylvania on the latter date and held this position until September, 1920, when he became a representative of the allocated lines of the United States Shipping Board, and it was this position which he held at the time of his death.

Alfred W. Gibbs, chief mechanical engineer of the Pennsylvania with headquarters at Philadelphia, died suddenly from heart failure on May 19 at his home in Wayne, Pa. Mr. Gibbs was born at Fort Filmore, N. M., on October 27, 1856. He attended Rutgers College Grammar School, New Brunswick, N. J., and Rutgers College (the latter institution in 1873 and 1874) and then entered Stevens Institute of Technology, Hoboken, N. J., from which institution he was graduated in 1878. In March of the following year Mr. Gibbs entered the service of the Pennsylvania as a special apprentice in the Altoona shops and continued as such until June 1, 1881, when he became a draughtsman. Four months later he left the Pennsylvania to become a draughtsman for the Richmond & Danville (now the Southern). In 1886 he was promoted to master mechanic and served in that position on several divisions until 1890, when he was appointed superintendent of motive power of the Central of Georgia. Two years later that position was abolished and he returned to the Richmond & Danville as master mechanic. In July, 1893, Mr. Gibbs returned to the Pennsylvania as assistant mechanical engineer and served in that position until September, 1902, when he was appointed superintendent of motive power of the Philadelphia, Wilmington & Baltimore (a subsidiary of the Pennsylvania). On January 1, 1903, he was promoted to general superintendent of motive power of the Pennsylvania Railroad and on July 1, 1911, was appointed to the newly created position of chief mechanical engineer, in which capacity he was serving at the time of his death. Mr. Gibbs was one of the managers of the Franklin Institute, Philadelphia. He served for many years as chairman of the Committee on Tank Cars of the Mechanical Division of the American Railway Association. He was a member of the advisory committee of the Locomotive Cyclopedia for each edition of that volume excepting that of 1912 and at the time of his death was chairman of this committee. Mr. Gibbs played a prominent part in the mechanical design of the electric locomotives built for the Pennsylvania Railroad's electrification at New York.



A. W. Gibbs

JOHN J. COTTER, engineman of northbound passenger train No. 517, of the Greenwood Lake division of the Erie Railroad, on the afternoon of May 13, at Riverdale, N. J., 28 miles from New York, saved the life of a little girl, seventeen months old, by crawling to the pilot of his engine and picking her up a second before she would have been struck. The child was Adele Cushmore, granddaughter of Ira M. Meade, an Erie engineman. She had crawled to the track from her home nearby, and was on or close to the rail. Seeing that she did not realize her danger, and estimating that it would be impossible to stop before reaching her, Cotter set the brakes and then crawled forward and reached the pilot just in time. By that time the train had been brought almost to a stop, and Cotter jumped off and ran ahead. The front wheel stopped about 30 feet beyond the child.